WORK PLAN

LOWER SILVER CREEK
Summit County, Utah

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TABLE OF CONTENTS

1.0 INTRODUCTION

The **Lower Silver Creek (LSC)** site was historically the wash out area for mine tailings from the upper Silver Creek Watershed above Park City, Summit County, Utah. As many as ten ore processing mills operated along the banks of Silver Creek in the late 1800s and early 1900s. The LSC site extends over 12 miles along the banks of Silver Creek from the northern boundary of Richardson Flat, two miles east of Park City, to the confluence of Weber River in Wanship. Silver Creek is the primary drainage in the watershed from Park City to Wanship. The Weber River is a Class 4, 3A, 2B, 1C stream (DERR 2001).

Under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980(CERCLA) as amended in accordance with the applicable provisions of National Oil and Hazardous Substance Pollution Contingency Plan (NCP), the Utah Department of Environmental Quality, Division of Environmental Response and Remediation is conducting surface water/sediment sampling of the lower silver creek area. The sampling is being conducted in conjunction with the Division of Water Quality and in cooperation with the United States Environmental Protection Agency, Region VIII (EPA).

2.0 OBJECTIVES

A significant amount of data has been collected from the upper part of the Silver Creek Watershed by Upper Silver Creek Watershed Stakeholders Group which was formed in 1999. However, very little data are available for Lower Silver Creek. The objective is to determine how mine tailings are impacting the surface water quality in the Lower Silver Creek and determine possible areas which are contributing to the metals loading of the surface water. A site reconnaissance was conducted on July 18-19, 2006 for a site walk through and to determine sampling locations. During the site reconnaissance, 28 sampling locations were selected. These include 5 possible piezometer locations. Sample results may be used for Silver Creek Watershed Load Reduction Alternative Assessment and Analysis under EPA Pilot Watershed Scale Demonstration Project (Attachment 3)

3.0 BACKGROUND INFORMATION

3.1 Site Location and Description

The LSC site is two miles east of Park City, Utah on State Road U-248, and east of junction US 40 to the Rail trail and Silver Creek. The site runs the length of Silver Creek, over 12 miles, from Richardson Flat Tailings site to the confluence with Weber River in Wanship, Utah. (Figures 1and 2). The site area covers the riparian habitat adjacent to Silver Creek. The southern portion of the site is as much as 2500 feet across, east to west. The northern portion of site is much smaller (250 feet).

3.2 Site History and Previous Work

Mining in the Park City area began around 1869 and the first shipment of ore, 40 tons, was sent out by rail in July 1870 (Boutwell, 1912). There have been as many as 10 mills operating along the banks of Silver Creek throughout the history of mining in Park City (Elliott 2001). The tailings from the mining operation were deposited in the Empire Canyon and all along Silver Creek.

Silver Creek is classified for beneficial use 3A and protection for cold water fish and cold water species (DWQ, 2001). There are four municipal drinking water wells within the site area. Mountain Regional SSD wells No. 2 east and No.1 west are in the northern portion of the site area near Wanship, and supply a population of 250. In southern portion of the site. Mutual Water Company supplies 150 people with water from wells No.3 and No.12.

The Utah Division of Water Quality has monitored the Silver Creek for more than 10 years and has listed the Silver Creek Watershed on the State of Utah 303 (d) list as impaired by zinc and cadmium. Eight of the ten monitoring sites identified in the TMDL study lie within the LSC site area. The Utah Division of Environmental Response and Remediation conducted an innovative assessment of the Lower Silver Creek site in 2002.

4.0 FIELD PROCEDURES

Sampling will consist of 23 sediment and 23 surface water samples from locations previously determined during field reconnaissance . Additionally, 5 piezometer samples will also be collected. Surface water sample at each location will be collected prior to the sediment samples. Surface water samples will be filtered on site and will be analyzed for dissolved and total metals (from filtered and non-filtered fractions, respectively). Temperatures, pH and specific conductance measurements will be made in the field. Flow measurements will also be made at each location. Surface water and sediment samples will be collected from the same locations. Sampling will begin at the downstream location and will continue in upstream direction.
Five piezometers may be installed and sampled to determine the contamination in the ground water.

4.1 Schedule of Work

The field sampling activities are scheduled during fall and spring seasons. Tentatively the fall sampling round is scheduled for August/September 2006 and spring round is scheduled for May /June 2007. Sampling locations and other aspects of this sampling plan may be modified based upon the results of fall sampling. It is anticipated that 4-6 days field work will be required for this sampling effort.

4.2 Health and Safety

Due to low hazard conditions at the site, Level D protective clothing will be worn during the sampling. The main physical hazards at the site are marshy conditions and horse flies. Working in the field during July/August can also cause heat stress/dehydration. All team members will be encouraged to drink fluids during each work day. A tailgate safety meeting will be held each morning prior to initiating each day's work.

4.1 Sampling Locations

Based upon the field reconnaissance, 28 sample locations were selected. These locations (including 23 surface water and five piezometers)are shown in Figure 3 and described in Attachment 1.

4.2 Sampling Methods

An adequate quantity of sampling equipment and disposable equipment will be supplied in order to avoid the need for field decontamination. If field decontamination becomes necessary, it will proceed according to the procedures outlined in the *RCRA Ground Water Monitoring Technical Enforcement Guidance Document* (US EPA, OSWER – 9950.1, 1986) and a decontamination blank will be prepared and analyzed. The sampling team will be required to wear non-latex gloves during the sampling event, and a new set of gloves will be worn for each sampling point.

Sampling will proceed according to the methods outlined in the DERR CERCLA Quality Assurance Project Plan (QAPP) of May 1999.

4.3 Surface Water Samples

Surface water samples will be collected directly into the appropriate container. Water samples will be tested for pH, temperature and specific conductance. Surface water and sediment samples will be collected at the same location. Surface water samples will be filtered in the field. The filtered aliquot will be analyzed for dissolved metals and non-filtered portion will be analyzed for total metals. Surface water samples will be preserved in the field with nitric acid.

4.4 Sediment Samples

Sediment samples will be collected at a depth of 0-6 inches with use of a stainless steel spoon and placed directly into an 8 ounce jar. There will be enough supply of stainless spoons on hand to avoid the decontamination in the field.

4.5 Piezometer Samples.

Piezometers will be installed using a hand auger. Piezometers will be sampled using a micro-bailer and analyzed for total metals. Piezometer samples will be analyzed for total metals.

4.6 Investigation-Derived Wastes

Disposable sampling equipment, latex and nitrile gloves and protective outerwear will be cleaned, double bagged and disposed of as non-hazardous waste. Excess sampling material will be returned to the location from which it was collected. Any hazardous materials generated will be disposed of in accordance with applicable federal, State and local requirements and in accordance with the guidelines outlined in the U.S. EPA Office of Emergency and Remediation Response's *Management of Investigation Wastes During Site Inspection* (OERR Directive 99345.3-02, May 91).

4.7 Analytical Parameters

Samples will be shipped as environmental samples under strict chain of custody to an EPA contract lab program (CLP) assigned laboratory. Surface water samples will be analyzed for dissolved and total metals listed in Form 1. Piezometer samples will be analyzed for total metals and sediment samples will also be analyzed for total metals.

5.0 FIELD QUALITY CONTROL PROCEDURES

Samples will be handled and preserved according to the QA/QC criteria in the QAPP (UDEQ/DERR 1999). The following quality assurance samples will be collected.

- Double volume inorganic field duplicate
- Double volume inorganic lab duplicate
- Split samples, if requested by any land owners
- Three blind duplicates for water samples
- Three blind duplicates for sediment samples
- Volatile organic samples are not being collected – no trip blank required

6.0 CHAIN OF CUSTODY

Samples will be handled and shipped to a contract lab in accordance with chain of custody protocol (UDEQ/DERR 1999).

7.0 DATA REDUCTION, VALIDATION AND REPORTING

The laboratory results will undergo data validation review. Any data that did not meet QA/QC criteria will be flagged appropriately.

8.0 REFERENCES

Boutwell, J.M. (John Mason); 1912: Geology and ore deposits of the park City District, Utah/John M. Boutwell, with contributions by Lester Hood Woolsey; Washington, D.C.; Government Printing Office.

EPA (U.S. Environmental Protection Agency); May 1991; Management of Investigative Derived Wastes During site Inspections, Technical Enforcement Guidance document; Office of Emergency and Remedial Response, OERR, 9345.3-02.

EPA (U.S. Environmental Protection Agency); September 1986; *RCRA Ground-Water Monitoring Technical Enforcement Guidance Document*; Office of Solid Waste and Emergency Response, OSWER 9950.1

UDEQ (Utah Department of Environmental Quality); April 1999, Quality Assurance Project Plan for Environmental Data Operations, CERCLA Branch, Division of Environmental Response and Remediation

UDEQ/DERR (Utah Department of Environmental Quality, Division of Environmental Response and Remediation); Innovative Assessment Analytical Results Report, Lower Silver Creek, Summit County, Utah

UDWQ (Utah Division of Water Quality); 2001: Memorandum; Silver Creek TMDL.

Form I

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

EPA Sample No.

Date _____

INORGANIC ANALYSIS DATA SHEET

LAB NAME _____ CASE NO. _____

SOW NO. _____ Lab Receipt Date _____

LAB SAMPLE ID. NO. _____ QC REPORT NO. _____

Elements Identified and Measured

Concentration: Low _____ Medium _____

Matrix: Water _____ Soil _____ Sludge _____ Other _____

ug/L or mg/kg dry weight (Circle One)

1.	Aluminum	13.	Magnesium
2.	Antimony	14.	Manganese
3.	Arsenic	15.	Mercury
4.	Barium	16.	Nickel
5.	Beryllium	17.	Potassium
6.	Cadmium	18.	Selenium
7.	Calcium	19.	Silver
8.	Chromium	20.	Sodium
9.	Cobalt	21.	Thallium
10.	Copper	22.	Vanadium
11.	Iron	23.	Zinc
12.	Lead	Precent Solids (%)	

Cyanide _____

Footnotes: For reporting results to EPA, standard result qualifiers are used as defined on Cover Page. Additional flags or footnotes explaining results are encouraged. Definition of such flags must be explicit and contained on Cover Page, however.

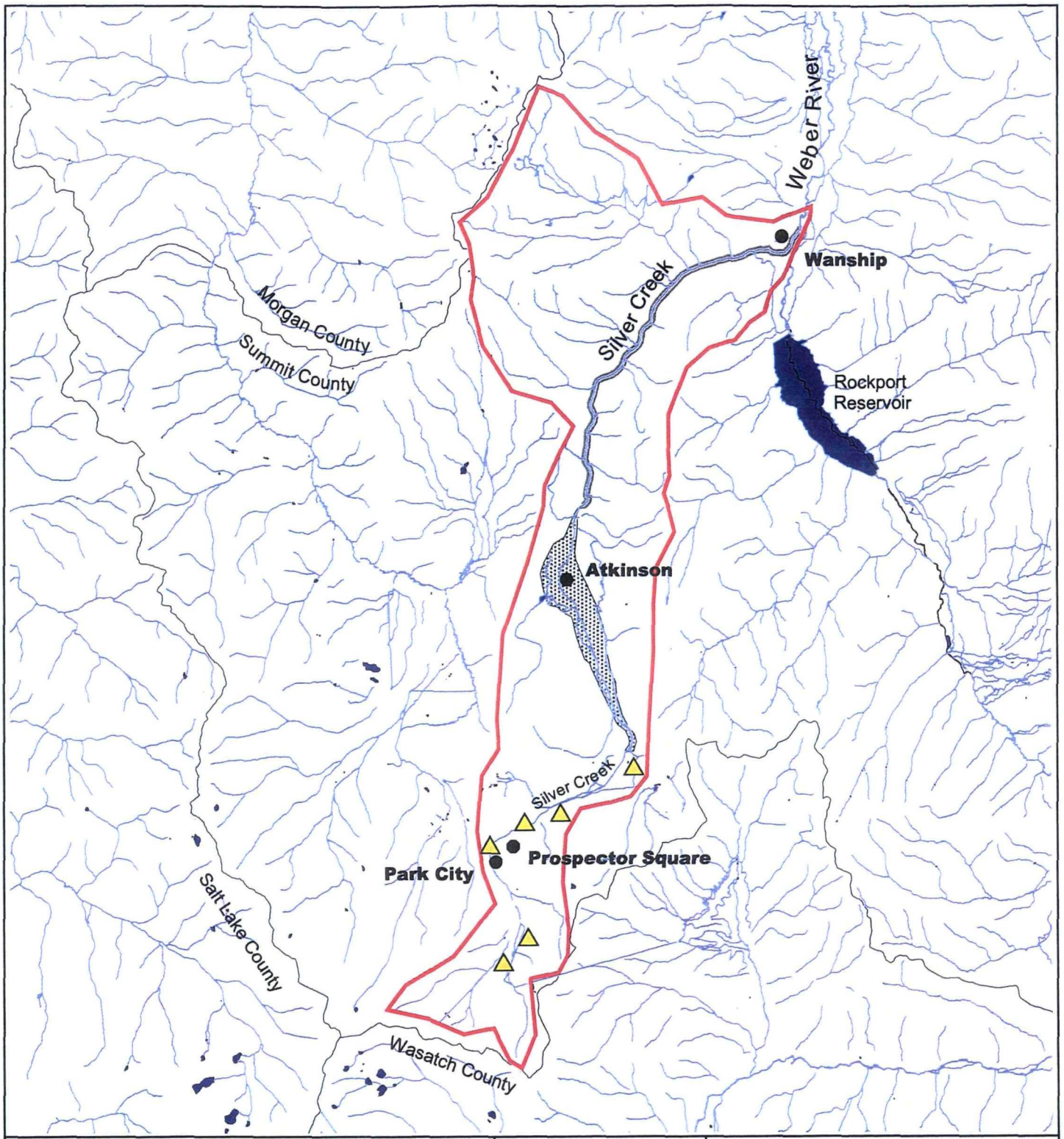
Comments: _____

_____

_____

_____

Lab Manager _____



0 0.8 1.6 2.4 3.2 4 4.8 Miles

Water Courses
Dataadmin.hdwco_qd24.geometery

Water Bodies
Dataadmin.hdwbo_qd24.geometery

Site area-southern portion

Site area-northern portion

Watershed Boundary (approx.)

CERCLIS-listed sites

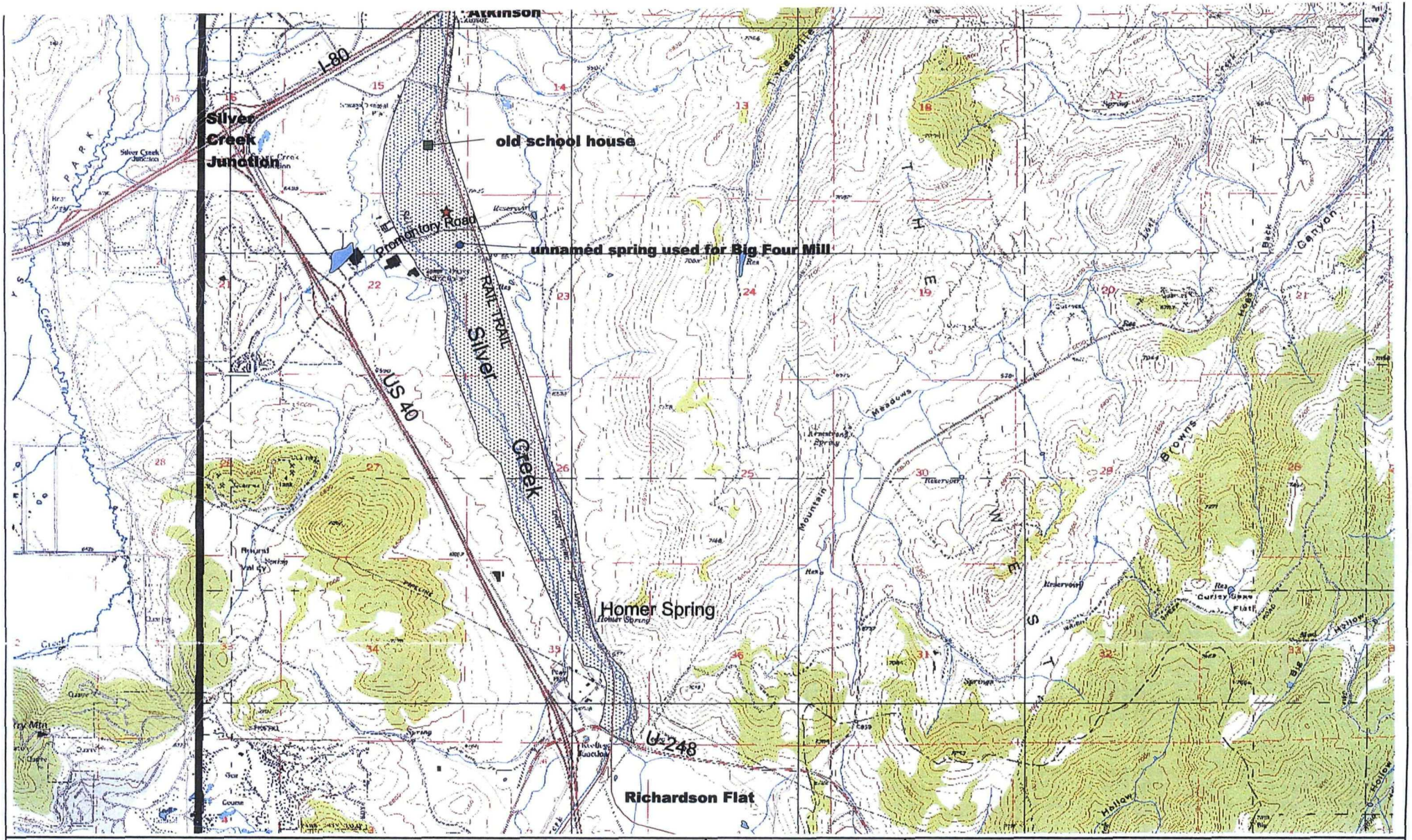
N

Site Location

Utah Department
of Environmental Quality
Division of Environmental
Response and Remediation

Figure 1
Site Map

Lower Silver Creek IA
Summit County, Utah



Legend

- Historical Big Four Mill Site and currently the site of a Pace ranch bldg.
- Site area - Southern portion
- Site area - Northern portion
- Road and Trails (Dataadmin.trrrd_st10.geometery)
- Rail Trail (Dataadmin.trrrd_st10.geometery)

Utah Department of Environmental Quality
Division of Environmental Response and Remediation

Figure 2
Site Location Map

Lower Silver Creek
Summit County, Utah

Lower Silver Creek Investigation
Samples LSC 001 to LSC 013

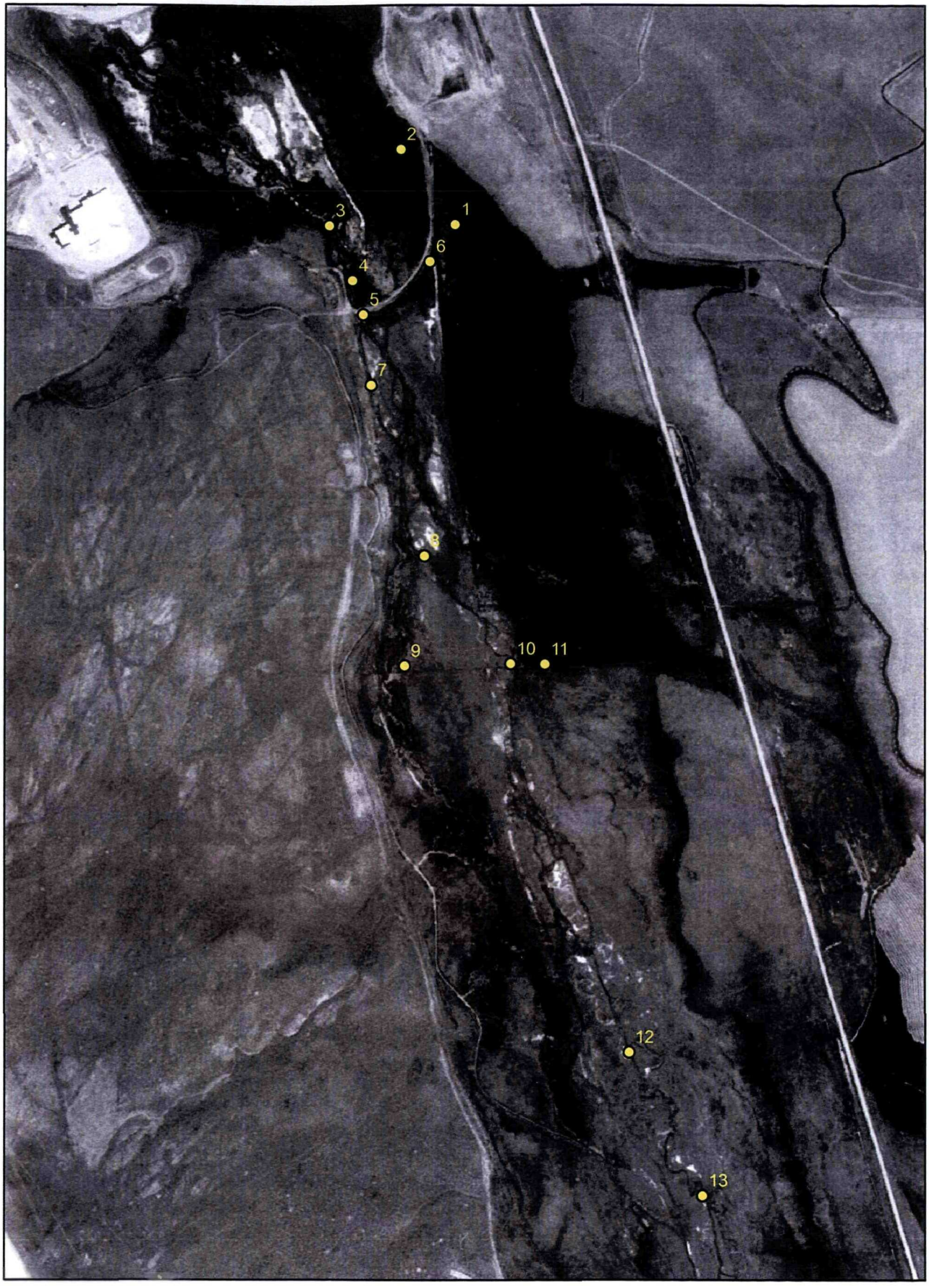


Figure 3

Lower Silver Creek Investigation
Samples LSC 013 to LSC 022

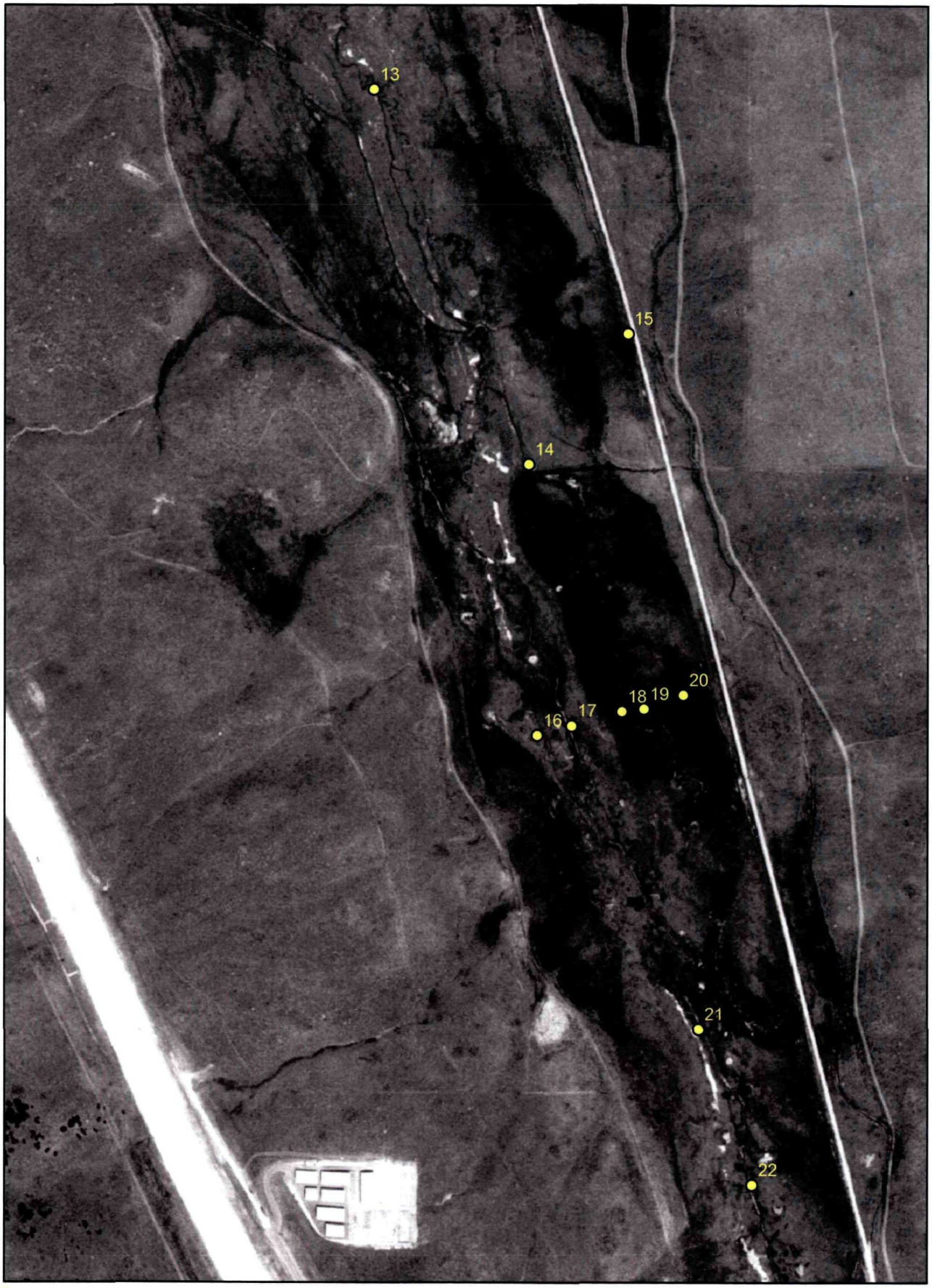


Figure 4

Lower Silver Creek Investigation
Samples LSC 022 to LSC 028

Figure 5

ATTACHMENT 1
Sampling Location Pictures

LSC-001: Photo facing west. GPS location ¼ mile south of rail trail entrance, approximately 200 yards west of rail trestle fencepost

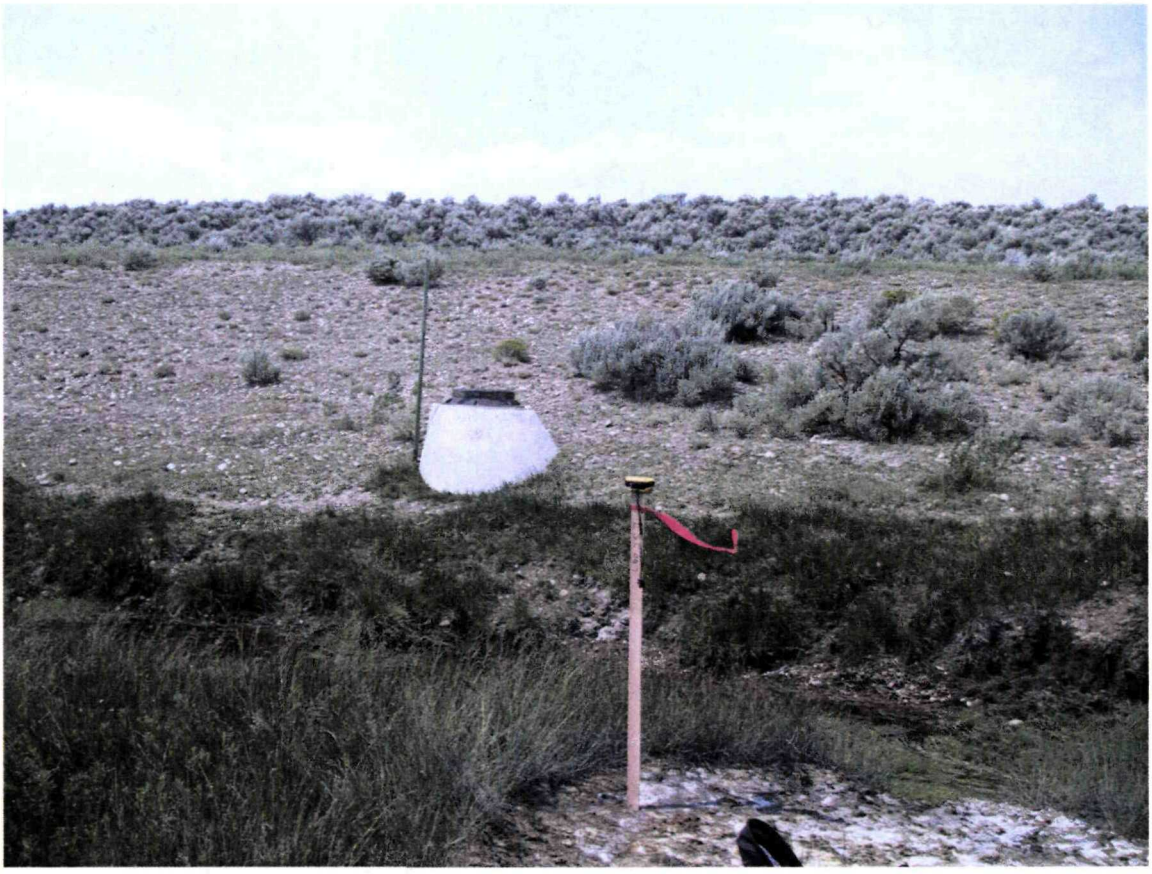
LSC-002: Photo facing west. GPS location north of LSC-001, 100 yards south-southwest of small, wooden shack

LSC-003: Photo facing northwest. GPS location west of LSC-002. 20 feet east of fence, directly east of stream

LSC-004: Photo facing south. GPS location south of LSC-003. East of stream. North of culvert in dirt road

LSC-005: Photo facing north-northwest. GPS location 10 feet south of culvert in dirt road. South of LSC-004

LSC-006: Photo facing south. GPS location 10 feet south of culvert/cross trail area. Located near ditch. 4 feet west of trail running north/south



LSC-007: Photo facing north-northwest. GPS location approximately 15 feet east of sewer manhole marked with green pole. Approximately 3 feet east of stream. South of LSC-006 and culvert

LSC-008: Photo facing north-northwest. GPS location east of creek. Approximately 200 yards south of LSC-006. Green building in background of photo

LSC-009: Photo facing east. GPS location 20 feet north of fence that runs up to rail trail. Just south of brown rail trail marker #5. ***location dry at time of GPS logging. Marked for springtime sampling ***

LSC-010: Photo facing east where stream intersects the fence. GPS location at fence post west of stream. Fence post used as marker. East of large, cement block

LSC-011: Photo facing east along fence and post. GPS location east of LSC-010. Fence used as marker. Stream intersection directly south of location. ***potential sampling location***

LSC-012: Photo facing northwest. GPS location east of stream. Green, concave roof building in background

LSC-013: Photo facing northwest toward sign on highway. GPS location just east of stream

LSC-014: Photo facing south-southeast. GPS location by dry creek bed. Fence located 50-75 feet south. Trail road approximately 200-300 yards east

LSC-015: Photo facing northwest. GPS location approximately 10 feet west of road, 15 feet east of fence, and 20 feet north of culvert in road

LSC-016: Photo facing southeast. Lone tree in background. GPS location approximately 20 feet southwest of dry creek. Approximately 50 feet northeast of small mound/hill. ***Location dry at this time. Potential piezometer and/or spring sampling location***

LSC-017: Photo facing south. Lone tree in background. GPS location approximately 75 yards east of LSC-016. 3 feet east of stream. ***Potential piezometer location***

LSC-018: Photo facing southwest. Lone tree in background. GPS location approximately 100 yards east of LSC-017. ***Potential piezometer location***

LSC-019: Photo facing southeast with rail trail fence gate in background. GPS location approximately 50 yards from LSC-018. ***Potential piezometer location***

LSC-020: Photo facing east-northeast. Trail marker #4 in background. GPS location approximately 100 yards west of trail. Approximately 150 yards east of LSC-019.
Potential piezometer location

LSC-021: Photo facing west toward highway and gray storage shed area. GPS location west of dry streambed, 10 feet east of elongated tailings pile. ***Location dry at this time. Use for spring sampling location***

LSC-022: Photo facing south towards JBP plant. Stream 3 feet west of stake/GPS location. ***Location may be mostly groundwater rather than surface/stream***

LSC-023: Photo facing south towards JBP plant. GPS location 3 feet northwest of ditch and pipe

LSC-024: Photo facing south towards I-248. GPS location 2 feet east of drainage ditch, 10 feet west of rail trail, approximately 100 yards north of I-248

LSC-025: Photo facing east towards hill and power lines. GPS location 2 feet west of dry creek bed. ***Use for spring sampling location***

LSC-026: Photo facing south toward I-248. GPS location approximately 4 feet west of irrigation ditch, 100 feet east of LSC-025. ***upstream irrigation ditch sample location***

LSC-027: Photo facing north toward hill and power lines. GPS location approximately 6 feet west of irrigation ditch, 2-300 feet east of rail trail and trail marker #37. ***location downstream of LSC-026***

LSC-028: Photo facing north towards trail bridge. GPS location approximately 5 feet west of ditch, 10 feet east of rail trail

ATTACHMENT 2
List of Field Equipment

SAMPLING EQUIPMENT CHECKLIST

for Site Inspection or Expanded Site Inspection

Lower Sil _____ **DATE:** Jul-06

Mo Slam _____ **TITLE:** Env Engineer

LIST COMPILED BY: Mo Slam **TITLE:** Env Engineer

Sample Containers

Quantity	Unit	Item	Notes
____	case	40 ml VOA Vials	72 vials per case
____	each	40 ml VOA Vials	
____	case	½ gal Amber Bottles	6 bottles per case
____	each	½ gal Amber Bottles	
____	case	1 liter plastic bottles	12 bottles per case
____	each	1 liter plastic bottles	
30	case	8 oz. Wide mouth jar	24 jars per case
____	each	8 oz. Wide mouth jar	
____	case	4 oz. Wide mouth jar	24 jars per case
____	each	4 oz. Wide mouth jar	
____	bundle	Plastic Sample Bags, 4" by 6"	100 per bundle, holds 2 - 40 ml vials
____	bundle	Plastic Sample Bags, 6" by 9"	100 per bundle, holds 1 - 8 oz. jar
____	bundle	Plastic Sample Bags, 5" by 12"	100 per bundle, holds 1 - 1 liter bottle
____	bundle	Plastic Sample Bags, 9" by 12"	50 per bundle, holds paperwork & ice
____	bundle	Plastic Sample Bags, 12" by 18"	50 per bundle, holds 1 - ½ gal amber bottle
____	each	Paint Cans, 1 quart	
____	each	Paint Cans, 1 gallon	
____	_____	Vermiculite	

Sample Preservation

Quantity	Unit	Item	Notes
5	bag	ice	not supplied - needs to be purchased
1	case	Nitric Acid	24 - 5 ml vials per case
____	each	Nitric Acid	5 ml vial
____	case	Hydrochloric Acid	24 - 1 ml vials per case
____	each	Hydrochloric Acid	1 ml vial
____	_____	Acetic Acid	*not typically used*
____	_____	Sodium Hydroxide	not typically used
____	_____	Other: _____	
____	_____	Other: _____	

Sample Documentation

Quantity	Unit	Item	Notes	
____	each	Laptop Computer w/ Forms II Lite		
____	each	Field Printer		
____	each	Box w/supplies for printer		
____	each	Field Book		
100	each	CLP Labels		100
100	each	CLP Sample ID Tags		100
____	each	CLP Custody Seals		100
5	each	Chain-of-Custody Forms	if not using Forms II Lite	
1	each	Digital Camera	include recharger	
____	each	Digital Storage Cards		
____	each	35mm Camera		
____	roll	35mm Film	speed (asa):	exposure:
____	each	Video Camera		
____	each	Video Cassettes for video camera		

Reference Materials

Quantity	Unit	Item
1	each	Site Sample Plan (unique to site)
1	each	Health and Safety Plan (unique to site)
____	each	Samplers Guide to Contract Laboratory Program, EPA OSWER, 1996
1	each	Quality Assurance Project Plan, UDEQ/DERR, 1999
____	each	Other: _____
____	each	Other: _____

Sample Shipping

Quantity	Unit	Item	Notes
5	each	Ice Chest	Size (qts): g 8 g 16 g 24 g 36 g 48 g 56
3	box	Bubble Wrap	
5	each	FedEx Airbills	
5	roll	Packaging Tape	
5	roll	Strapping Tape	
____	_____	Cardboard	Boxes for shipping or pieces for padding
____	each	Custody Seals	Also Listed under Sample Documentation
____	_____	Other: _____	
____	_____	Other: _____	
____	_____	Other: _____	
____	_____	Other: _____	

Decontamination

Quantity	Unit	Item	Notes
	each	Tap water	in 5 gallon carboy
	each	Distilled Water	in 5 gallon carboy
	each	Deionized Water	in 5 gallon carboy
	box	Alanox	4 lb. Box
	each	Rinse Water Sprayer	
	each	Deionized Water Sprayer	
	each	Rinse Water Spray Bottle	
	each	Deionized Water Spray Bottle	
	each	Bucket or Tub	
	each	Scrub Brush	
	roll	Paper Towels	
	box	Kimwipes	
	bottle	Hand Sanitizer	
	container	Antibacterial Towelettes	
	each	Garbage bags	

Sample Collection

Quantity	Unit	Item	Notes
15	each	Metal Spoons	
	each	Shovel	
1	each	Hand Auger	
1	each	Peristaltic Pump	include charger/power supply
	feet	¼ O.D. Poly tubing	1000' per roll - use down well w/peristaltic pump
	feet	Silcon/Tygon tubing	100' per roll - use w/peristaltic pump
	each	¾" Disposable Bailer	include valves for sampling
	each	1½" Disposable Bailer	include valves for sampling
	roll	Nylon Line	for use with bailers
	each	Plastic Dropcloths	to cover ground around well while bailing
	each	Bucket/Barrel/Tank	to contain purge/decon waste water
	each	Submersible Pump	include control unit
	each	Generator	power for submersible pump
	each	Extension Cord	use with submersible pump
	each	Hose	use with submersible pump
1	each	Flow Meter	
1	each	pH Meter	
1	each	Conductivity Meter	
	package	Litmus Paper	
35	each	0.5 micron Filters	for dissolved metal samples
	each	Well Sounder	

Surveying

Quantity	Unit	Item	Notes
	each	Trimble GPS Unit	including recharger
	each	Storey Pole	Optional - for use with GPS
	each	Antenna	Optional - for use with GPS
___	each	Tape Measure	
___	each	100' (up to 300') Engineers Tape	
___	each	*Measuring Wheel*	
___	each	Hip Chain	include extra string
___	each	Brunton Compass	
___	bundle	Wooden Stakes	
___	bundle	Wooden Lathes	
___	bundle	Pin Flags	
___	roll	Surveyer's Flagging	
___	can	Inverted Tip Spray Paint, White	For marking proposed excavations for Blue Stakes
___	can	Inverted Tip Spray Paint	Color: _____
___	each	Inverted Paint Applicator	

Safety/Personal Protection (provided by Department for each employee, each field team member should individually bring the following)

Quantity	Unit	Item	Notes
	each	Hard Hat	
5	each	Safety Glasses	
5	each	Steel-toed Boots	
5	each	Rubber Boots	
	each	Full-face Respirator	
___	each	Cloth Overalls	
___	each	*Cold Weather Gear*	
___	each	Safety Vest	
___	each	Field Vest	
5	each	Rain Gear	
___	_____	Other: _____	
___	_____	Other: _____	
___	_____	Other: _____	
___	_____	Other: _____	

Additional Safety/Personal Protection

Quantity	Unit	Item	Notes
3	box	Disposable Latex/Nitrile Gloves	50 pair per box
___	each	Tyvek Overalls	
___	each	Disposable Ear Plugs	
___	each	Ear Muffs (hearing protection)	
___	pair	Leather Gloves	
___	each	Dust Mask (Disposable)	
___	pair	Respirator Cartridges	Type: _____
___	each	Life Vests/Flotation Devise	
___	each	Body Harness	Use to tie off while sampling at edge of water
___	each	Safety Lines	Use to tie off while sampling at edge of water
2	bottle	Sunscreen	
2	can	Insect Repellent	
1	each	Drinking Water Cooler	
___	each	First Aid Kit	
___	bottle	Eyewash	
___	can	Wasp Spray	
___	_____	Other: _____	
___	_____	Other: _____	
___	_____	Other: _____	

Miscellaneous Items

Quantity	Unit	Item	Notes
___	each	Flashlight	
___	each	Tool Kit	
___	pair	Binoculars	
___	pair	2-way Radios	Include Batteries
___	each	XRF Unit	Include Recharger
___	each	Radiation Meter	Include Recharger/Batteries
___	each	HNU Photoionization Detector	Include Recharger/Batteries
___	each	Explosimeter/Oxygen Indicator	Include Recharger/Batteries
___	each	H2S Indicator	Include Recharger/Batteries
___	each	Organic Vapor Analyzer (OVA)	Include Recharger/Batteries
___	each	Maps	Title: _____
___	each	Maps	Title: _____
___	_____	Other: _____	
___	_____	Other: _____	
___	_____	Other: _____	
___	_____	Other: _____	

ATTACHMENT 3
EPA Pilot Watershed Scale Demonstration Project

FY 2006/07 – EPA Pilot Watershed Scale Demonstration Project (PWSDP)

Executive Summary

Project Title: Silver Creek Watershed, Load Reduction Alternatives Assessment and Analysis Pilot

Environmental Setting / Problems: The Silver Creek watershed from the confluence with the Weber River to its headwaters was listed on Utah's 1998, 2000, and 2002 303(d) list as impaired with a high ranking due to elevated levels of cadmium and zinc. The watershed is classified as a 3A – cold water fishery and drinking water supply. There are currently two sites, Empire Canyon and Richardson Flat which are in the CERCLIS database. An Innovative Assessment was completed in 2002 on the lower Silver Creek, and it was recommended for CERCLIS listing.

There is a desperate need for additional analysis of the pollutant source reduction options to better understand how to optimize cost and pollutant reduction effectiveness at the watershed scale. Based on earlier efforts, estimates for non-locationally-specific source control measures were nearly 100 million dollars. The previously assessed measures are primarily based on either the complete isolation of polluted materials from the stream flow or removal of all materials from the stream throughout extended segments of Silver Creek. A more practical review, assessment, and quantification of load reduction alternatives is needed to determine the most cost effective approach to attaining water quality standards/ARARs. This goal of this pilot study is to build off the previous watershed level analyses and develop an approach that can be applied to Silver Creek, as well as other mining impacted waters in the western US, and to review, assess, and select a combination of management options that maximize the efficiencies (pollution reduction and cost) of restoration efforts in the watershed. The pilot project will compare and quantify various source reduction options and associated cost scenarios that will result in more cost effective and timely load reductions and ultimately achievement of existing water quality standards.

Project Description:

The Silver Creek watershed is a joint water and waste program site. The area has been heavily impacted by historic mining. Metals of concern include zinc, lead, arsenic and cadmium. There are two significant point sources in the watershed—the Prospector Square, which drains the Judge Tunnel, and the Waste Water Treatment Plant at the lower end of the watershed. The initial TMDL assessment included gross (watershed-scale) allocations but provided an insufficient level of detail necessary to justify the expense of specific source reduction and remediation efforts.

Lower Silver Creek is currently undergoing significant development. Assessment and quantification of the location and amount of existing loads will be critical information necessary to negotiate with the developers in hopes that remediation could be conducted during development. Water quality and sediment data have been collected but an assessment is needed to determine the nature and extent of mine waste and its potential loading. This data would allow us to map the existing waste piles and conduct an alternatives analysis to determine the expected load reductions from remediation of the waste and the corresponding costs that correlate to various cleanup alternatives. This would allow us to prioritize the cleanup of the various sites, thus allowing us to get

the "biggest bang for our buck." We are concurrently working with Summit County in an attempt to establish a soils ordinance to establish cleanup levels to be utilized in upcoming development projects. The County is also reviewing options for siting a waste repository in the uplands to accommodate the tailings that will need to be removed from the riparian zone.

Overall, this project is essential to effectively plan and guide remediation efforts and ensure compliance with water quality standards/ARARs throughout the Silver Creek watershed. It will allow for targeted identification of the most significant sources of metal loadings to the creek, the quantification of their loads, the development of a matrix of source controls and their expected load reduction, and an evaluation cost and effectiveness of multiple source control alternatives to support attainment of water quality standards/ARARs and better guide remedial decision-making.

Utah DERR/DWQ Sampling

The Utah DERR and DWQ will conduct a joint sampling effort to examine the significant loading sources in the lower watershed. Samples will be collected for water quality, sediment and flow throughout the lower Silver Creek Watershed, from Richardson Flat to Wanship, utilizing the same sampling locations as in 2002, to provide a baseline of conditions in the watershed. A focused study area was selected in the Meadows section which is directly below Richardson Flat. The area from U-248 at the base of Richardson to Promontory Road includes a parcel proposed for development, areas indicating significant impacts from irrigation, and the gravel operation. This study area is representative of the lower watershed and will provide good transferability of data to other sites in the lower watershed. Piezometers will be used in the study area to determine the impact of loading related to irrigation practices and spring runoff. Because flood irrigation is used in this area, aerial photography has indicated that flow through the upper tailings may be mobilizing metals from those tailing into the creek. If this proves to be the case the Department of Agriculture provides EQUIP money to convert flood irrigation systems into sprinkler systems and to line leaking ditches. Snowmelt runoff will also be characterized. Tailings piles will be evaluated and screened visually and through soil profiles, and the soil concentrations in that subset will be analyzed and piles GPS'd to focus on sites with higher concentrations that tend to mobilize metals. This data will be provided to the contractors to conduct the alternatives analysis.

Reconnaissance - week of July 17th (select sampling sites for placement of piezometers, GPS sites, delineate significant tailings piles, observation notes)
Sampling - week of July 30th
Sampling – October (non-irrigation season)

Funds Requested:

FY 2006 and 2007 funds requested $100,000.

UTDEQ/DERR Match = Field work (in-kind)

I Work Plan.

The following general tasks highlight the proposed approach to conducting this pilot. It is anticipated that contractor support will be made available to support this effort and the contractor will work with EPA to prepare a more detailed scope of work for this effort.

Task 1: Compilation of existing data and collection of new data to characterize the pollutant sources. The previous TMDL analysis and Innovative Assessment will serve as the starting point for this analysis. Additional data being collected by Utah DWQ and DERR will supplement the previous analysis. We will also be working with the state monitoring program to collect any additional water quality data and the state permits group in regards to the effluent limits in the 2 UPDES permits, in additional to the 319 program for implementation.

Other sources of information might include:

- Available aerial photography could be used to generate topographic maps that identify tailing piles throughout the lower watershed.
- The State DERR and DEQ will conduct sampling efforts in 2006 with placement of piezometers to determine surface flow through existing tailing piles to assess loading contributions (in-kind contribution)
- Areas found to leach significant metals into the stream could be surveyed to provide volume estimates.

Task 2: Conceptual Model Development. Based on the previous TMDL and the additional data collection efforts by UDEQ, a conceptual model of the Silver Creek watershed will be developed that identifies known and suspected pathways of pollutant transport, known and suspected sources of pollutants, and known or potential human and environmental receptors. The conceptual model will be developed to include all major pathways of pollutants from mining impacted watersheds to serve as the starting point to other watershed assessments. The conceptual model developed for Silver Creek will highlight the relative contributions of each source/pathway important in the watershed.

Task 3: Develop a matrix of management options associated with mining activities (in general) and their load reduction potential (in general). This matrix will be developed from literature values and will include practices ranging from toe-removal from the stream to entire waste pile removal. This matrix will serve as the menu of management options assessed in the Silver Creek watershed.

Task 4: Develop Remedial Action Objectives for each medium of interest, including size and extent of sites, size of onsite extractions, isolation, or other source control technology, timeframe in which containment, removal goals can be achieved, and distance from disposal technologies (for removal appproaches)

Task 5: Using the information compiled in Tasks 3 and 4, we will quantitatively evaluate different combinations of alternatives and will develop alternatives for cleanup that consider their effectiveness, implementability, and cost. The load reduction versus cost of each alternative will be presented with cost optimization curves that are tied to achievement of water quality standards. One alternative to be assessed will includes estimate costs and expected reductions in load related to the lining of the Prospector Square Drain to eliminate groundwater increases in load.

I. Outputs and Progress Reports

Deliverable Products:

A final project report will be developed that summarizes the conceptual model development, the approach and how it can be applied to other locations, and the expected pollution reductions and impact on WQS in-stream for selected alternatives.

II. Budget

Task 1: $10,000
Task 2: $10,000
Task 3: $10,000
Task 4: $25,000
Task 5: $40,000
Task 6: $ 5,000

SITE INVESTIGATION HEALTH AND SAFETY PLAN

GENERAL INFORMATION

NAME OF SITE: Lower Silver Creek DATE PLAN PREPARED: 7/21/2006

LOCATION OF SITE: Near Silver Summit - Summit County

PLAN PREPARED BY: Mo Slam PLAN APPROVED BY: _____

TYPE OF SITE: Site Inspection DATE OF PROPOSED FIELD WORK: August/Sept 2006

WORK OBJECTIVES: Collection of environmental samples for Site Inspection

PRELIMINARY WORKER HAZARD ASSESSMENT: ☐ SERIOUS ☐ MODERATE ☒ LOW ☐ UNKNOWN

SITE CHARACTERISTICS

WASTE TYPE: ☒ LIQUID ☒ SOLID ☐ SLUDGE ☐ GAS

CHARACTERISTIC(S): ☐ CORROSIVE ☐ IGNITABLE ☐ RADIOACTIVE ☐ VOLATILE ☐ TOXIC ☐ REACTIVE ☐ UNKNOWN ☒ OTHER Tailings

FACILITY DESCRIPTION: Tailings Piles

PRINCIPAL DISPOSIBLE METHOD (TYPE AND LOCATION): Tailings Deposition on surface

UNUSUAL FEATURES (TERRAIN, EMBANKMENTS, WATER BODIES, POWER LINES, ETC.): Stream, Fences

SITE HISTORY (COMPLAINTS, RESPONSE ACTIONS, INJURIES, ETC.): Not Known

SITE HAZARD EVALUATION

DESCRIBE MATERIALS LIKELY TO BE ENCOUNTERED ON-SITE: Mine Tailings

DESCRIBE OTHER HAZARDS: Heat, trip, fall, snakes, bugs and bees

DESCRIBE PRIMARY EXPOSURE HAZARDS (INHALATION, INGESTION, DERMAL, ETC.): Dermal and Ingestion

SITE SAFETY PLAN

LEVEL OF PERSONAL PROTECTION: ☐ A ☐ B ☐ C ☒ D

SITE PERIMETER ESTABLISHED: ☐ YES ☐ NO ☒ NOT APPLICABLE

MAP OF SITE ATTACHED: ☒ YES ☐ NO

ZONE(S) OF CONTAMINATION IDENTIFIED: ☐ YES ☐ NO ☒ NOT APPLICABLE

MODIFICATIONS TO PROTECTION LEVEL: Will be upgraded to level C if determined necessary by safety officer. In the event that level A or B is needed, EPA and local authorities will be contacted and site will be turned over to an agency with level A and/or B capabilities.

SURVEILLANCE AND MONITORING EQUIPMENT: ____

PERSONNEL AND EQUIPMENT DECONTAMINATION PROCEDURES: Disposable sampling equipment (including disposable gloves) will be used in an effort to minimize the need for decontamination. Equipment that needs decontamination will be washed in an Alconox solution and triple rinsed, the final rinse with DI water. Make sure boots are clean before entering the vehicle and returning to the office.

SPECIAL EQUIPMENT, FACILITIES, OR PROCEDURES: ____

WORK LIMITATIONS (WEATHER CONDITIONS, WORKING HOURS, ETC.): Plenty of fluid for hot weather

SITE ENTRY PROCEDURES: ☒ NOT APPLICABLE Typically, in Site Assessment work, there is no "entry procedure" because "zones of contamination" and "site perimeter" have not been established.

TEAM ORGINIZATION AND RESPONSIBILITIES

TEAM MEMBER	DISCIPLINE	RESPONSIBILITIES
Mo Slam	Scientist	Sample Collection
Chad Gilgen	Scientist	Sample Collection
Kari Lundeen	Scientist	Sample Collection
	Scientist	Sample Collection

DISPOSAL OF INVESTIGATION DERIVED MATERIAL

DESCRIBE: Disposible sampling equipment will be double bagged and disposed as non-hazardous. Excess sampling material will be returned to sample location. Hazardous materials will be disposed of in accordance with applicable laws.

OTHER SITE-SPECIFIC HAZARDS AND SAFETY CONSIDERATIONS

DESCRIBE: ____

SITE RESOURCES

WATER SUPPLY: _____

POWER SUPPLY: _____

NEAREST TELEPHONE OR RADIO: Field crew will have cell phone as part of field equipment.

OTHER (DESCRIBE): _____

University of Utah *Health Sciences Center*

Physician Recruitment

Online Pharmacy

Customer Service

Services Available

Maps & Directions

Health Information

Temas de Salud en el Español

U Health Plans/ Healthy U

Bienvenidos a Healthy U

Community Clinics
Administration
Ambassador Bldg.
127 South 500 East
SLC, UT 84102

phone: 801-587-6326
fax: 801-587-6313
E-mail Administration

THE UNIVERSITY OF UTAH

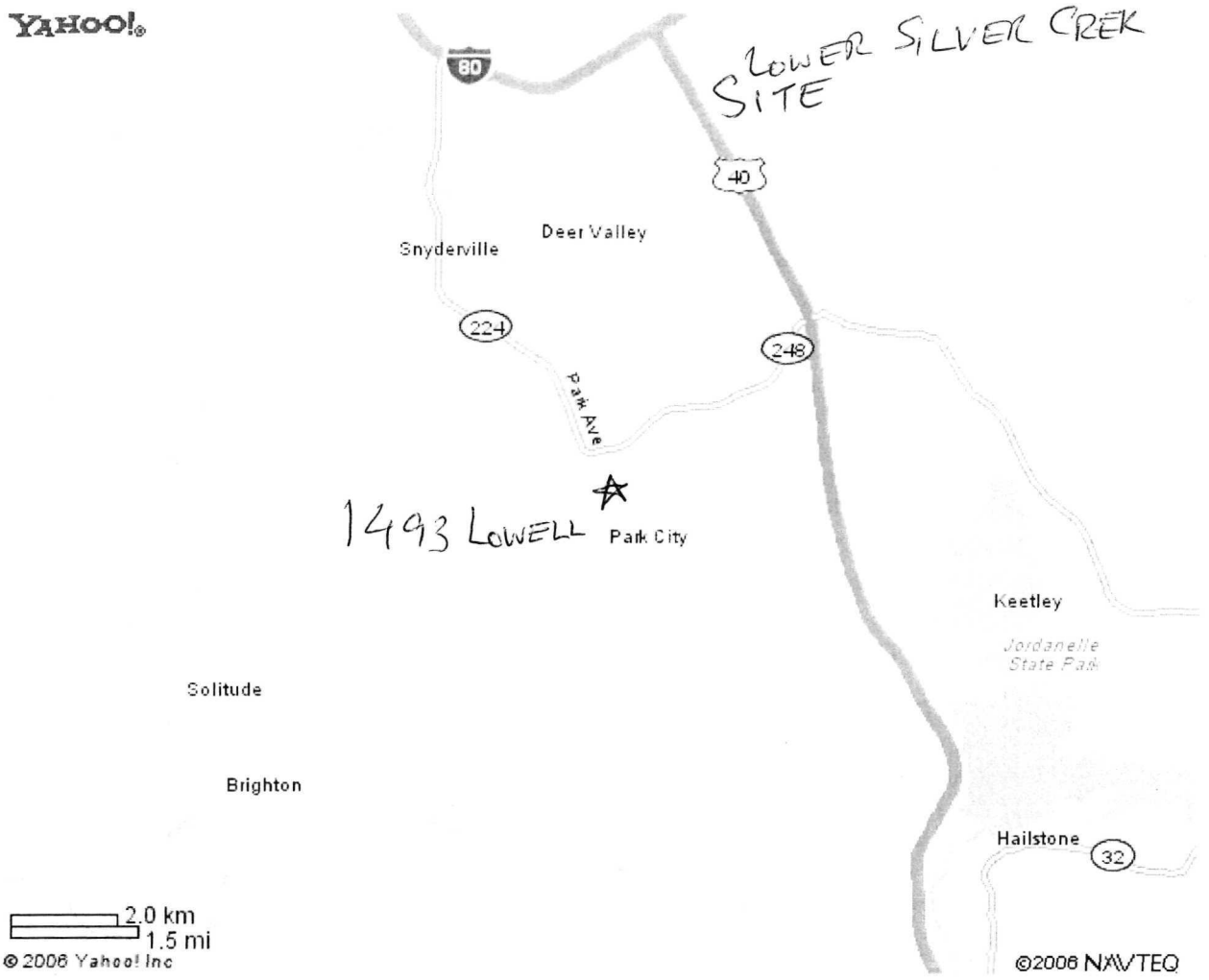
Home | Hospitals & Clinics | Health Sciences Cen

Park City Mountain Resort Urgent Care

Community Clinics

Print Directions & Driving Instructions

Address:	1493 Lowell Avenue Park City, UT 84060
Phone:	**Main Phone:** 435-655-7970 **Main Fax:** 435-940-0905 **Only Open During Ski Season:**
Hours:	**Health Center** Monday-Friday: 9:00 am to 6:00 pm Saturday: 9:00 am to 6:00 pm Sunday: 9:00 am to 6:00 pm
Center Manager/Director:	**Dori Cannard, RN**



HOSPITAL ROUTE

EMERGENCY INFORMATION

SERVICE	SPECIFIC INFORMATION	TELEPHONE #
AMBULANCE		911
EMERGENCY ROOM		
POISON CONTROL		1-800-222-1222
POLICE / SHERIFF / HIGHWAY PATROL		911
FIRE DEPARTMENT		911
HEALTH DEPT CONTACT		
UTILITY LOCATOR	Blue Stakes	1-800-662-4111
LIFE FLIGHT		911
OTHER:		
OTHER:		
OTHER:		
OTHER:		
OTHER:		

*** ALL EMERGENCY TELEPHONE NUMBERS MUST BE REVERIFIED IMMEDIATELY PRIOR TO FIELDWORK ***

NUMBERS VERIFIED BY: _____ DATE: _____

NOTE ANY PROBLEMS ENCOUNTERED OR ADJUSTMENTS NEEDED: _____

_____

_____

SIGNATURE OF INDIVIDUAL WHO VERIFIED NUMBERS: _____

PRE-SAMPLING SAFETY MEETING

DATE: JULY 27, 2006 TIME: 10:00 A.M. LOCATION: DEQ/DEQR

CONDUCTED BY: _____ SIGNATURE: _____

ATTENDEES

NAME (PRINTED)	HAVE REVIEWED PLAN?		SIGNATURE
MO SLAM	YES	NO	
CHAD GILGEN	YES	NO	
KARL LUNDEEN	YES	NO	
	YES	NO	
	YES	NO	
	YES	NO	
	YES	NO	
	YES	NO	
	YES	NO	
	YES	NO	

SAMPLING TOPICS PRESENTED

☒ SAMPLING PLAN / SAMPLING LOCATIONS: As defined in the Work Plan

☐ SOIL SAMPLES: ____

☒ SURFACE-WATER SAMPLES: ____

☒ SEDIMENT SAMPLES: ____

☐ GROUND-WATER SAMPLES: ____

☐ AIR SAMPLES: ____

☐ SOURCE CHARACTERIZATION SAMPLES: ____

☐ BIOTA SAMPLES: ____

☐ OTHER SAMPLES: ____

☐ USE OF SPECIAL EQUIPMENT: ____

☐ DECONTAMINATION PROCEDURES: ____

☐ REVIEW OF QA / QC FIELD PROCEDURES: ____

☐ REVIEW OF CHAIN-OF-CUSTODY PROCEDURE: ____

☐ OTHER: ____

SAFETY TOPICS PRESENTED

☐ LEVEL OF PROTECTION: ☐ A ☐ B ☐ C ☒ D

☐ PROTECTIVE CLOTHING AND EQUIPMENT: ____

☐ CHEMICAL HAZARDS: ____

☐ PHYSICAL HAZARDS: ____

☐ EMERGENCY PROCEDURES: ____

☐ HOSPITAL / MEDICAL CLINIC: ROUTE & LOCATION ENCLOSED

☐ OTHER EMERGENCY FACILITIES: ____

☐ USE OF SPECIAL EQUIPMENT: ____

☐ REVIEW OF HEALTH AND SAFETY PLAN: ____

☐ OTHER: ____

QUALITY ASSURANCE PROJECT PLAN

FOR ENVIRONMENTAL DATA OPERATIONS

FINAL PLAN

CERCLA Branch
Division of Environmental Response and Remediation
Utah Department of Environmental Quality

April 1999

Sectional Revision Dates on Table of Contents

APPROVALS:

Date: 4/23/99

Brad Johnson
CERCLA Branch Manager
Division of Environmental Response & Remediation
Utah Department of Environmental Quality

Date: 4-21-99

Elizabeth Yeomans
Quality Assurance Officer
Division of Environmental Response & Remediation
Utah Department of Environmental Quality

Date: 5/12/99

Luke Chavez
Site Assessment Manager
U. S. EPA, Region VIII

Date: 5/12/99

Wayne Anthofer
Director Grants, Audits & Procurement Program
U. S. EPA, Region VIII

Date: 5/11/99

Anthony Medrano
Quality Assurance Officer
U. S. EPA, Region VIII

TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) is intended to satisfy Environmental Protection Agency (EPA) Region VIII requirements for the collection of data of known and documented quality during Superfund field activities in the State of Utah. This QAPP was developed by the Utah Department of Environmental Quality (UDEQ), Division of Environmental Response and Remediation (DERR), CERCLA Branch, as a generic Quality Assurance Project Plan conforming to applicable Region VIII requirements stated in the document *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5*, (EPA QA/R-5 document) dated August, 1994.

By law, U.S. EPA-funded environmental data collection programs must have an EPA-approved QAPP before sample collection begins. The purpose of this requirement is to ensure that the data collected are of known and suitable quality and quantity. However, even programs that do not receive EPA money need to consider developing a QAPP, especially if data is to be used by state, federal, or local resource managers. The Quality Assurance Project Plan is a written document that outlines the procedures an environmental data collection project will use to ensure that the data samplers collect and analyze, the data they store and manage, and the reports they write, are of high enough quality to meet Data Quality Objectives (DQOs) for the specific project.

This QAPP is intended to serve as the basic document for all program activities related to the collection of environmental data for UDEQs CERCLA Branch of DERR. These activities may include Preliminary Assessment (PA), Site Inspection (SI), Site Inspection Prioritization (SIP), Expanded Site Inspection (ESI), Remedial Investigation (RI), Removal (REM), Emergency (E), Feasibility Study (FS), Remedial Design (RD), and Remedial Action (RA) sampling activities. This QAPP is intended to be an umbrella document governing such activities, with specific details for each project/activity to be outlined in a site-specific Work Plan (WP) or Sampling and Analysis Plan (SAP), with the exception of Emergency Response actions and some PA activities. The Utah Department of Health (UDH), Division of Epidemiology and Laboratory Services (DELS), Bureau of Environmental Chemistry and Toxicology (BECT), maintains the capacity to perform emergency testing of samples from chemical spills. These services are available to UDEQ. The BECT also has the capability of testing hazardous wastes in support of state and local hazardous waste investigations and environmental clean up programs.

SAPs based on this parent QAPP should address site-specific aspects, such as the number and locations of samples, the various media to be sampled, corresponding analytical parameters, tests, etc. This QAPP further describes the information to be considered and/or addressed when preparing SAPs. A sample SAP outline can be found in Appendix A, and contains a list of topics to be addressed as applicable. The site-specific SAP should also include appropriate references to this parent QAPP. During a site investigation, situations may be identified which require modification or deviation from the parent QAPP or SAP. In these cases, a justification for the deviation should be provided in the Field Activities Report (FAR) or the Analytical Results Report (ARR), with an accompanying discussion on the potential impact, if any, on data usability and/or comparability.

Deviations affecting the use or interpretation of the results should also be reported along with the results. This QAPP will focus on aspects such as criteria and procedures that are expected to be common to the environmental data collection efforts for each site.

This document also provides the rationale and Quality Assurance requirements for activities in the state based on Date Quality Objectives (DQOs). The DQO process is a planning process for ensuring environmental data are of the type, quantity, and quality needed and required for decision making. The site-specific SAPs incorporate site-specific DQOs and specific Quality Assurance /Quality Control (QA/QC) requirements.

Upon approval, this QAPP will govern the development of new SAPs and new environmental data collection activities for UDEQs CERCLA Branch of DERR. When feasible, the specifications in this QAPP may be incorporated into ongoing activities. Therefore, project managers of ongoing projects may elect to employ this QAPP as an amendment to their existing plans to the extent appropriate for the ongoing activities. Because this QAPP better reflects current mechanisms for obtaining analytical services, it may be particularly appropriate for existing plans to be amended with those portions of this QAPP. Of course, impacts on data usability and/or comparability with existing data should be considered when amending existing plans.

According to EPA guidance, 24 distinct elements can be included in a QAPP (and therefore a SAP), although not all elements may be necessary for all programs. Which elements end up being included in a SAP or WP will depend on the project's DQOs, goals, scope, data uses, and on the guidance received from the CERCLA and EPA Region VIII quality assurance contacts. The 24 elements are grouped into four overall categories and are listed in the Table of Contents. In Appendix B, a Glossary may be found which defines various terms and concepts associated with quality assurance and quality control.

2.0 PROJECT MANAGEMENT

2.1 Element A1: Title and Approval Sheets

As required by the EPA, the *QA/R-5* document requires the following information on the Title and Approval Sheet(s):

- the plan title
- the name of the organization(s) involved in the project
- the names, titles, and signatures of appropriate approving officials, and their approval dates.

(See also Section 2.3 below).

2.2 Element A2: Table of Contents

The sections, references, appendices, figures, and tables are listed in the Table of Contents. Use of a document control format in the upper right-hand corner of each page in the body of this QAPP has been included to meet the *QA/R-5* requirements and to facilitate revisions of the QAPP document when necessary. This will allow DERR to update an individual section (and the Table of Contents) when necessary without changing the whole document. (See Section 2.4 below for more information regarding QAPP updates).

2.3 Element A3: Distribution List

List the individuals and organizations that will receive a copy of your approved QAPP and any subsequent revisions. Include representatives of all groups involved in your environmental data collection effort.

UDEQ-DERR Personnel:

Brad Johnson	DERR CERCLA Branch Manager
Steven Thiriot	Site Assessment Section Manager plus 6 Project Managers
Duane Mortenson	Federal Facilities Section Manager plus 4 Project Managers
Mark Day	Construction Management Section Manager plus 4 Project Managers
Brent Everett	Remedial Projects Section Manager plus 5 Project Managers
Elizabeth Yeomans	CERCLA Quality Assurance Officer

Utah State Health Laboratory
Commercial Laboratories

(Continued)

EPA Personnel:

Anthony Medrano	EPA Region VIII Quality Assurance Officer
Wayne Anthofer	EPA Region VIII Director, Grants, Audits & Procurement Program
Luke Chavez	EPA Region VIII Site Assessment Manager

2.4 Element A4: Project/Task Organization

The *EPA QA/R-5* document requires the identification of the individuals and organizations participating in the project, with a discussion of their specific roles and responsibilities. The principal data users, the decision-makers, the project QA manager, and all persons responsible for implementation must be identified. In addition, a concise organization chart showing the relationships and the lines of communication among all project participants must be shown. (See also Section 1.0 above for information regarding the scope of this QAPP).

The CERCLA Branch is part of the Division of Environmental Response and Remediation, with the position of branch manager currently held by Brad Johnson (see Figure 1). Within the CERCLA Branch, the Site Assessment section, which includes Emergency Response duties, is managed by Steven Thiriot. The Remedial Projects section is managed by Brent Everett, the Construction Management section is managed by Mark Day, and the Federal Facilities section is managed by Duane Mortensen. The Division of Environmental Response and Remediation, directed by Kent Gray, is part of the Utah Department of Environmental Quality, which is directed by Dr. Dianne Nielson. The four CERCLA Branch Section Managers report to the CERCLA Branch Manager and are responsible for project management and the performance of all section staff members. They also coordinate and review site and remedial projects and oversee Emergency Response actions. Neil Taylor is the lead Duty Officer for Emergency Response situations.

Brad Johnson, Manager of the CERCLA Branch, reports to EPA Region VIII pertaining to CERCLA activities, coordinates and reviews activities of section managers, and coordinates activities with Utah State Attorney General's Office pertaining to enforcement activities. The Utah Attorney General's Office supports and advises the CERCLA Branch on legal aspects of the CERCLA program, including contractual, enforcement, and policy matters. DERR also has its own staff attorneys, who provide assistance on legal matters related to Superfund activities.

Luke Chavez manages the EPA Region VIII Site Assessment Program in Utah. Mr. Chavez receives and approves DERR's PA/SI work, including Sampling and Analysis Plans. Tony Medrano, the EPA Region VIII Quality Assurance Officer, monitors and advises the DEQ-DERR Quality Assurance Officer, Elizabeth Yeomans, on quality assurance procedures and issues, and assists in resolutions of problems, when necessary.

Figure 1
Organizational Chart

EPA REGION VIII

Division Director, Waste Management
Max H. Dodson

Preparedness, Assessment, Emergency Response Program
Doug Skie

Prevention/Preparedness Team
Jim Knoy

Regional Federal Facility Team
Jay Silvernale

Federal Facilities Program
Terry Anderson

Remedial Unit A
Barry Levene

SF Remedial Response Program
Dale Vodehnal

Remedial Unit B
Bert Garcia

Assessment Team
Rotating

Response Team
Rotating

EPA Region VIII Director
Grants, Audits & Procurement Program
Wayne Anthofer

EPA Region VIII Quality Assurance Officer
Tony Medrano

EPA Contract Laboratory Program
(CLP or Equivalent)

UDEQ Director
Dianne Nielson

UDEQ-DERR
Division Director
Kent Gray

UDEQ-DERR
CERCLA Branch
Brad Johnson

Utah Attorney General's Office
(Enforcement Action)

CERCLA Branch
Site Assessment & Emergency Response
Steven Thiriot

CERCLA Branch
Remedial Projects
Brent Everett

CERCLA Branch
Federal Facilities
Duane Mortensen

CERCLA Branch
Construction
Mark Day

CERCLA Branch Quality Assurance Officer
Elizabeth Yeomans

UDEQ DERR CERCLA *Staff*

Utah Dept. Of Health
Div. of Epidemiology
& Laboratory Services

Commercial Laboratories

The CERCLA Branch Manager is responsible for approving the QAPP, followed by EPA Region VIII concurrence from the EPA Quality Assurance Manager. The DERR Site Assessment Section Manager is responsible for approving the site-specific SAPs for Preliminary Assessments, Site Inspections (including SIPs and ESIs), and Emergency Response actions. The Remedial Projects Section Manager is responsible for approving remedial activities. All four Section Managers are responsible for contracting Superfund work. The respective roles and responsibilities of EPA and DERR regarding plan reviews and approval are as follows: DERR approves a Draft SAP and it is followed by EPA Region VIII concurrence or recommended revisions by staff from the EPA program. After the revisions are made by the DERR Project Manager, it is signed by the same person and resent to the EPA, and the EPA Site Assessment manager finalizes the Draft. This process may occur several times, until DERR and the EPA agree on a Final Version. Plan approvals will be documented by a dated signature on the SAP from the DERR Project Manager, and the title page indicates whether it is the Draft or Final version of the SAP.

The CERCLA Branch Quality Assurance Officer (QAO), Elizabeth Yeomans, is responsible for coordinating laboratory facilities between CERCLA Project Managers and either the EPA Region VIII Sample Broker, the Utah Department of Health, or a Commercial Laboratory. The QAO also has the responsibility of informing CERCLA Branch upper level management, the EPA Regional Sample Broker, the State Health Lab, and Commercial Labs of quality assurance needs, problems, and overall status of data collection efforts. The QAO will be the official point-of-contact for all CERCLA Branch quality assurance matters and will coordinate on these matters with the CERCLA Branch, Region VIII EPA, the State Lab, and outside labs. The QAO is responsible for providing or obtaining technical assistance when needed for CERCLA Branch project managers.

CERCLA Branch Project Managers are responsible for writing SAPs and other reports, performing site-specific field activities, collection of samples, shipping of samples to the labs, data evaluation, and assessments. The implementation of the quality control requirements for environmental data collection within a project is the responsibility of the site-specific Project Manager, with the assistance of the CERCLA Branch Quality Assurance Officer. CERCLA Branch Project Managers will follow the sampling procedures described in *Sampler's Guide to the Contract Laboratory Program* (EPA, 1996), the *EPA Region VIII QAPP and SAP Review Guidelines*, dated January, 1996, and the SAP developed for the specific site.

The laboratories are responsible for sample analysis and data processing, and must meet the applicable laboratory requirements described in their QAPP (each lab will have their own). Samples collected at sites employing another source of non-EPA funding, may be analyzed at the Utah State Health Laboratory or other commercial laboratories certified to do so. Data validation is the responsibility of the party who receives the data from the laboratory and should be performed by a qualified chemist or validator. Oftentimes, the EPA will hire a contractor to do its data validation. (See also Section 5.0 below).

2.5 Element A5: Problem Definition/Background and Element A6: Project/Task Description

The *EPA QA/R-5* document requires a QAPP to contain a narrative statement of the specific problem the project is designed to address (see also Section 2.8). Since each project will have its own site-specific problem(s) to address, the SAP will contain this statement. Examples of the decisions that might be made following the collection of environmental data for PA/SI/SIP and ESI work, would be to determine if additional site investigation is needed; to determine if the site should be included on the National Priority List; or determine if no further action is needed.

Sufficient background information on the site must also be provided or referenced (in an easily-accessible reference) in the site-specific SAP to lend an historical perspective to a particular project. The Project/Task Description element requires a description of the work to be performed and a schedule for its implementation to be included in the site-specific SAP. Identify how the data will be used and who will use it. The following information will be addressed or cross-referenced (e.g., reference to background information in an easily-accessible Work Plan) in appropriate detail in site-specific SAPs:

- site description and history;
- reason for environmental concern;
- existence of relevant previous data and general conclusions of relevant previous studies;
- adequacy of existing data and reason why additional/new data is needed;
- discussion of measurements/tests that will be made under the scope of the SAP;
- applicable technical and regulatory standards (e.g., MCLs);
- time, resource or other constraints on project;
- special personnel and equipment requirements;
- project schedule;
- project and quality records required, including the types of reports needed.

A method for keeping this QAPP current and approving and distributing changes to the CERCLA Branch is as follows: the QAO will incorporate changes into the applicable Section, update the Section and the document control format, as well as the Table of Contents. To facilitate distribution, the QAPP will be kept in a three-ring binder, and as the updates occur, CERCLA staff and any others with a copy of the QAPP (e.g., State Health Laboratory) will be instructed to take out the old and put in the new section. The QAO will maintain a master distribution list for the QAPP (see section 2.3). The QAPP will be reviewed periodically by the QAO to determine if it continues to meet current program requirements. Suggested changes identified by QAPP users should be submitted to the QAO for consideration during periodic updates. The need for QAPP changes might also be identified as the result of problems in implementation discovered during data reviews, audits, and other oversight activities.

The following are examples of QAPP revisions that do not require written approval, but will require distribution to the QAPP users: changes to analytical services request forms and procedures; updates to forms (including state custody forms) when the update does not reduce information content; and updates due to personnel changes. These interim changes can then be formally approved during the next periodic update of the QAPP. Appendix C contains some of the current forms in use.

2.6 Element A7: Quality Objectives and Criteria for Measurement Data

The site-specific Sampling and Analysis Plan will include a detailed statement of the project Data Quality Objectives (DQOs) and measurement performance criteria. DQOs for measurement data include precision, accuracy, representativeness, completeness, comparability, and measurement range (see also Appendix B, Glossary). It may not be possible to include actual numbers for some of the data quality measurements within the first version of the SAP document. A discussion of the methods to be used for making actual determinations after sampling has begun will be needed. Data quality indicators should be given for each parameter to be measured, in each matrix. The easiest way to present quantitative information is in a table. The following table illustrates the precision, accuracy, and measurement range for an hypothetical project's DQOs.

Table 1. Data Quality Objectives for Measurement Data

MATRIX	PARAMETER	PRECISION	ACCURACY	MR*
Water	pH	. 20%	. 0.5	3 to 10.5 units
Water	Temperature	. 20%	. 0.2□C	-10□ to 100□C
Water	Dissolved Oxygen	. 20%	. 0.3 mg/L	1 to 20 mg/L
Water	Turbidity	. 20%	. 0.2 mg/L	0 to 1000 NTU

* MR = Measurement Range

In cases where a formal DQO process is not needed, the DQOs and measurement criteria will be stated in quantitative terms to the extent practicable. Refer to *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, EPA QA/R-5*, 1994, and *Guidance for the Data Quality Objectives Process, EPA QA/G-4, Final*, 1994.

2.7 Element A8: Project Narrative

Discuss in a narrative form the following issues as they pertain to the project or task, as needed (see also Element A5 and A6):

- work to be performed or hypothesis to be tested
- anticipated use of the data

- how the success of the project or task will be determined (quantitatively or qualitatively) (A7, D3)
- survey design requirements and description (B1)
- sample type and sampling location requirements (B2)
- sample handling and custody requirements (B3)
- selection of analytical methods (B4)
- calibration and performance evaluation samples for sampling and analytical methods used (B5)
- sampling or analytical instrumentation requirements (B6)
- plans for peer or readiness reviews prior to data collection (C1)
- any on-going assessments during actual operation/oversight (C1)

QAPP elements corresponding to the items to be addressed in the narrative are given in parentheses. The narrative should demonstrate to technical or QA reviewers that the project or task will achieve its stated data quality objectives.

2.8 Element A9: Special Training Requirements/Certification

Identify and describe any specialized training or certification requirements needed by personnel in order to successfully complete the project or task. Discuss how such training will be provided and how the necessary skills will be assured and documented.

2.9 Element A10: Documentation and Records

Itemize the information and records which must be included in a data report package and specify the desired reporting format. Documentation can include raw data, field logs, instrument printouts, and results of calibration and QC checks. Specify the laboratory turnaround time needed. Specify whether a field sampling and/or laboratory analysis *case narrative*[1] is required to provide a complete description of any difficulties encountered during sampling or analysis. Specify any requirements for the final disposition of records and documents, including location and length of retention period.

[1] *Case narrative* refers to an annotated summary of the analytical work performed by a laboratory that describes in narrative form what activities were performed and identifies any problems encountered. The case narrative provides additional information to the user in interpreting the data received.

3.0 MEASUREMENT/DATA ACQUISITION

This group of elements covers all aspects of measurement systems design and implementation, ensuring that appropriate methods for sampling, analysis, data handling, and QC are employed and are documented.

3.1 Element B1: Sampling Process Design

The site-specific SAP will outline the experimental design of the project and the anticipated project activities, including:

- The types and numbers of samples required
- The design of the sampling network
- The sampling locations and frequencies
- Sample matrices
- Measurement parameters of interest
- The rationale for the design

It is recommended that a table format be used in each SAP. The table(s) should include the following applicable information:

Sample Matrix	Sample Location	Sample Preservation	Parameter Measured	Sample Volume	Type of QC Sample
	Sample Container	Sample Frequency		Sample Holding Times	

Each SAP will identify in detail the sampling event schedule and conditions. The actual sampling conditions will be specified in field notebooks, and later the final report, and include discussions on deviations from the SAP. If individual sampling plans are to be developed for discrete project phases, the site-specific SAP will include their preparation schedule. Where appropriate the SAP will address access considerations and limitations.

3.2 Element B2: Sampling Methods Requirements

The site-specific SAPs will describe the procedures for collecting samples. Guidelines may also be found in the *QA/R-5* document and in the Utah Division of Laboratory Services *Quality Assurance Program Plan* (August 1996); both are on file with CERCLAs QAO. The sampling methods and equipment are to be identified, including any implementation requirements, decontamination procedures, and materials needed. For each sampling method, the SAP will describe specific performance requirements and identify any support facilities needed. The discussion should also address what to do when a failure in the sampling or measurement system occurs and who is

responsible for corrective action. The site-specific SAP will also address handling of investigation derived wastes. Information on management of investigation derived wastes generated during PAs and SIs is provided in *Management of Investigation-Derived Wastes During Site Inspections, 1991*, EPA/540/G-91/009. Additional sampling methods information may be found in the *Sampler's Guide to the Contract Laboratory Program*, 1996.

3.3 Element B3: Sample Handling and Custody Requirements

The site-specific SAP must describe the provisions for sample handling and custody, taking into account the nature of the samples, special sampling considerations, the maximum allowable sample holding times before extraction or analysis, and available shipping options and schedules. For example, when samples are shipped to an EPA Contract Laboratory (CLP) laboratory the Project Manager will follow the applicable CLP bottle handling and sample container chain-of-custody requirements. These labeling, shipping, custody, and notification requirements are explained in the *Sampler's Guide to the Contract Laboratory Program*, 1996. Additional information requirements, such as use of indelible ink only and who is responsible (the sampler) for the care and custody of the sample until sample shipment, are described in the same guide. Appendix C contains current analytical services request forms for samples which are EPA-funded and sample guidelines for samples to be analyzed at the State Health Laboratory.

3.4 Element B4: Analytical Methods Requirements

The required analytical methods and equipment to be used will be identified in the site-specific SAP. It will include any extraction methods, laboratory decontamination procedures and materials (in the case of hazardous or radioactive samples), waste disposal requirements, and any specific performance requirements for the method. In planning the analytical methods to be used, the project managers will consider whether the CLP specifications will meet the Data Quality Objectives of each site-specific project. The selection of analytical methods and analytical services will be based on a consideration of the project DQOs, including the following aspects:

- Target analytes/compounds;
- Required minimum sample volumes;
- Laboratory sub-sample size (portion of sample used by lab for analysis);
- Sample preparation and digestion methods;
- Applicable regulatory requirements (e.g., TCLP for RCRA waste leachability; drinking water methods, etc.);
- Sample matrix;
- QA/QC requirements (e.g., identity, frequency, and acceptance criteria for laboratory QC samples);
- Holding time;
- Turnaround time;
- Shipping requirements (e.g., may need to use local analytical service);

- Sensitivity needed (e.g., compare project reference levels such as MCLs against achievable detection limits of method for that matrix);
- Expected concentration level of sample and ranges covered by method;
- Method interferences and likely presence and concentration of sample co-contaminants;
- Reporting requirements and related data review needs;
- Cost;
- Lead-time needed for arrangements; and
- Availability of analytical services.

This evaluation should take place during the planning stages of a sampling project and the analytical services selected should be documented in the SAP. For example, the detection limits required to meet the project DQOs for some risk assessments might be lower than the Contract Required Detection Limits offered by the CLP. The standard CLP digestion and analytical methods might not be suitable for the sample matrix of interest. The CLP data turnaround times might be too long for some emergency response sampling projects. For situations such as the emergency response scenario, it is possible that a combination of CLP services for the non time-critical analytes and alternative fast-turnaround services for the time-critical analytes would be adequate to meet the project DQOs. If it is determined that CLP RAS services will not be adequate for all or some of the samples to be collected, alternatives should be explored. The EPA Region VIII Sample Broker can be consulted for guidance on Superfund analytical services that will meet project DQOs. The Utah State Health Laboratory may also be consulted for guidance on analytical services for state-funded environmental data collection activities. Methods and standard operating procedures (SOPs) used by the State Health Laboratory may be found in their QAPP; a copy of which is on file with CERCLAs QAO. When exploring analytical services options, considerations such as the following should be taken into account: costs, DQO flexibility, and lead time requirements.

The SAP should also address what to do when a failure in the analytical system occurs and who is responsible for corrective action. Where field analyses are to be performed, the SAP will list the equipment to be used and will precisely identify the limits of precision and accuracy required. It is suggested that this section in the SAP include, in table format, information required to evaluate the potential for achieving DQOs. The table should identify analytes, analytical methods, sample holding times, sample preservation, types of containers required, detection limits required, and any other information pertinent to evaluation of the Data Quality Objectives (see also Section 3.1).

3.5 Element B5: Quality Control Requirements

QC samples are used to estimate the precision and accuracy of analytical results and to examine sources of error introduced by field and laboratory practices. Identification of the Quality Control procedures for each sampling, analysis, or measurement technique will be necessary in the site-specific SAP. This section of the SAP should list each required QC procedure, along with the

associated acceptance criteria and corrective action. Quality Control procedures may include matrix spikes, duplicates, blanks, blinds, laboratory control samples, surrogates, or second column confirmation. State the frequency of analysis for each type of QC check, and the spike compounds and levels. State or reference the required control limits for each QC check and corrective action required when control limits are exceeded. It is recognized that QC procedures must frequently be modified on a project-specific basis in order to meet data specifications. As specified by the SAP, a designated number of field QC samples may be included in each batch of samples which are sent to the laboratory. Note that the types and frequencies of field QC samples should always meet project DQOs. A designated number of laboratory QC samples must be included in each batch of samples sent to the laboratory, as specified in the EPA laboratory contract. Because the amount and type of QC samples collected vary between EPA Regions, always refer to Regional guidance (Utah is in EPA's Region VIII). Field QC samples may include field duplicates, trip blanks, equipment blanks, field blanks, and double or triple volume samples. The field QC samples should be prepared (i.e., labeled, packaged, preserved, and shipped to the assigned laboratory) identically to the primary field samples, and should remain "blind" to the laboratory to ensure indiscriminate handling. Each field QC sample receives a separate sample number.

Laboratory QC samples for organics include blanks, internal standards, matrix spikes and matrix spike duplicates, and surrogates. Laboratory QC samples for inorganics include matrix spike and sample duplicates. The laboratory QC sample is an additional volume of an existing sample required by the lab's contract; the additional volume must be supplied by the sampler. **Samplers should designate one sample per matrix per 20 samples as a "laboratory QC" sample at a minimum.** For more information, see the EPAs *Sampler's Guide to the Contract Laboratory Program,* 1996.

3.6 Element B7: Instrument Calibration and Frequency

The site-specific SAP must identify all tools, gauges, instruments, and other sampling, measuring, and test equipment used for data collection activities affecting quality that must be controlled and, at specified periods, calibrated to maintain performance within specified limits. A description or reference of how calibration will be conducted using certified equipment and/or standards with known valid relationships to nationally recognized performance standards is also necessary. If no such nationally recognized standards exist, document the basis for the calibration. Indicate how records of calibration shall be maintained and be traceable to the instrument. The Utah State Health Laboratory's instruments and operational standards may also be found in their QAPP.

3.7 Element B9: Data Acquisition Requirements

Identify any types of data needed for project implementation or decision making that are obtained from non-measurement sources such as computer data bases, spreadsheets, programs, and literature files. Define acceptance criteria for the use of such data in the project. Discuss any limitations on the use of the data resulting from uncertainty in its quality and from the impact of adding more error to the results.

3.8 Element B10: Data Management

Describe the project data management scheme, tracing the path of the data from their generation in the field or laboratory to their final use or storage. Describe or reference the standard record-keeping procedures, document control system, and the approach used for data storage and retrieval on electronic media, if applicable. Discuss the control mechanism for detecting and correcting errors and for preventing loss of data during data reduction (e.g., calculations), data reporting, data entry to forms, reports, and databases, as applicable. Provide examples of any forms or checklists to be used.

Identify and describe all data handling equipment and procedures to process, compile, and analyze the data. This includes procedures for addressing data generated as part of the project as well as data from other sources. Include any required computer hardware and software and address any specific performance requirements for the hardware/software configuration used. Describe the procedures that will be followed to demonstrate acceptability of the hardware/software configuration required.

4.0 ASSESSMENT/OVERSIGHT

This group of elements addresses the activities for assessing the effectiveness of the implementation of the project and associated QA/QC. The purpose of assessment is to ensure that the site-specific Sampling and Analysis Plan is implemented as described.

4.1 Element C1: Assessments and Response Actions

The site-specific SAP must identify the number, frequency, and type of assessment activities needed for this project. Assessments include, but are not limited to, the following:

- Surveillance
- Peer review
- Management systems review
- Readiness review
- Technical systems audit
- Performance evaluation
- Audit of data quality
- Data quality assessment.

List and describe the assessments to be used in the project. Discuss the information expected and the success criteria (i.e., goals, performance objectives, acceptance criteria specifications, etc.) for each assessment proposed. List the approximate schedule of activities. For any planned assessments (utilizing personnel from within the project groups), identify the participants and their exact relationship within the project organization. For independent assessments, identify the organization and person(s) that will perform the assessments. Describe how and to whom the results of the assessments will be reported.

The site-specific SAP will define the authorities of the assessors. For example, if the assessors should order a work suspension upon finding a significant condition, this section delineates clearly their authority to do so. The SAP must define explicitly the unsatisfactory conditions under which the assessors are authorized to act. Recognizing that assessments may be needed at any time during the project, the SAP will provide a schedule for the assessments to be performed.

The SAP must also discuss how response actions to non-conforming conditions will be addressed and by whom. It must identify who is responsible for implementing the response action. The SAP will further describe how response actions will be verified, validated, and documented.

4.2 Reports to Management

The SAP must identify the frequency and distribution of reports issued to inform management of the following:

- Status of the project;
- Results of performance evaluations and system audits;
- Results of periodic data quality assessments; and
- Significant quality assurance problems and recommended solutions.

The preparer and the recipients of the reports will be identified in the SAP.

5.0 DATA VALIDATION AND USABILITY

This group of elements covers the Quality Assurance activities that occur after the data collection phase of the project is completed. Implementation of these elements determines whether or not the data conform to the specified criteria, thus satisfying the project objectives.

5.1 Element D1: Data Review, Validation, and Verification Requirements

The site-specific SAP will state the criteria to review and validate - that is, accept, reject, or qualify - data, in an objective and consistent manner. Examples of all forms or checklists must be included in the SAP. The EPA Region VIII Quality Assurance Officer or his/her designated representative may audit laboratories used by Region VIII. Audits of laboratories for the CLP program are performed under mechanisms specific to that program by EPA CLP personnel. When non-CLP laboratories are to be used, they must demonstrate competence in the desired analyses by having completed appropriate State Certification, which is granted and regulated by the Utah Department of Health, Division of Epidemiology and Laboratory Services.

5.2 Element D2: Validation and Verification Methods

The site-specific SAP will describe the process to be used for validating and verifying data, including the chain-of-custody for data throughout the life cycle of the project. Data validation is an in-depth review of analytical data that involves an examination of raw laboratory data. Data validation can be employed to help ensure that informed decisions are made based on data of known and documented quality. Data is typically validated against the project-specific criteria provided in the analytical services request (see Appendix C). The need for data validation and criteria should be based on project specific DQOs and addressed in the SAP. The SAP will discuss how issues will be resolved and the authorities for resolving such issues. It will include a description of how the results are conveyed to data users.

5.3 Element D3: Reconciliation with Data Quality Objectives

The site-specific SAP must describe how the results obtained from the project will be reconciled with the Data Quality Objectives (DQOs). The SAP must also describe how issues will be resolved and discuss how limitations on the use of the data will be reported to decision makers.

6.0 QAPP IMPLEMENTATION

This QAPP is the blueprint for environmental data operations for the CERCLA Branch in the Division of Environmental Response and Remediation, Utah Department of Environmental Quality. The approved QAPP must be implemented as prescribed; however, it is not inflexible. When conditions or requirements change during environmental data operations, the QAPP or SAP must be revised, then reviewed and approved in the same manner as the original document.

Under EPA policy, no environmental data operations may begin to collect data before the QAPP has been approved by authorized EPA personnel or other persons to whom this authority has been specifically delegated. This applies to work performed intramurally by EPA staff and extramurally by contractors and assistance agreement holders.

Specific guidance for preparing, reviewing, and approving QAPPs may be found in a companion document, EPA QA/G-5, *Guidance for Quality Assurance Project Plans*. The guidance document applies the QAPP requirements given in this document for the planning, implementation, and assessment of environmental data operations and links the QAPP requirements to the DQO process. The guidance provides examples of issues and situations typically encountered when planning data collection activities. Other guidance documents that are related to the QAPP include:

- *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, and
- *Guidance for the Data Quality Assessment Process*, EPA QA/G-9 (in process).

These documents provide guidance on activities critical to successful environmental data operations and complement the QAPP preparation effort.

7.0 REFERENCES

40 CFR Chapter 1, Part 31, "Uniform Administrative Requirements for Grants and Cooperative Agreement to State and Local Governments".

48 CFR Chapter 15, Subpart 1546.2, "Contract Quality Requirements".

EPA Region VIII QAPP and SAP Review Guidelines, January, 1996. Document on disk as QA_REV.GDE.

ISO 8402-1994, *Quality Management and Quality Assurance - Vocabulary*, April 1994.

U.S. Environmental Protection Agency (EPA), *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations*, EPA QA/R-5, Draft Interim Final, 1994.

U.S. EPA, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, 1994.

U.S. EPA, *Guidance for Quality Assurance Project Plans*, EPA QA/G-5, (in process).

U.S. EPA, *Guidance for the Data Quality Assessment Process*, EPA QA/G-9, (in process).

U.S. EPA, *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, QAMS-005/80, 1980.

U.S. EPA, *Management of Investigation-Derived Wastes During Site Inspections*, OERR Directive 9345.3-02, EPA/540/G-91/009, May 1991.

U.S. EPA, *Policy and Program Requirements to Implement the Mandatory Quality Assurance Program*, EPA Order 5360.1, 1984.

U.S. EPA, *Sampler's Guide to the Contract Laboratory Program*, EPA/540/R-96/032, 1996.

U.S. EPA, *The Volunteer Monitor's Guide to Quality Assurance Project Plans*, EPA 841-B-96-003, September, 1996.

Utah Division of Laboratory Services, *Quality Assurance Program Plan*, August 1996.

APPENDIX A

SAMPLING AND ANALYSIS PLAN OUTLINE

SAMPLING AND ANALYSIS PLAN (SAP) OUTLINE

NOTES: Some of the information called for in this outline may be addressed in the corresponding Quality Assurance Project Plan (QAPP). For example, the QAPP might contain descriptions of data review procedures and Standard Operating Procedures (SOPs) for sample collection. If the corresponding QAPP information is applicable to the activities being addressed in the SAP, then the SAP can reference the specific QAPP section for that information. If such cross-references are made, then the SAP must state that a complete set of the relevant procedures will be provided to the field personnel and be available in the field.

Not all of the information called for in this outline will be applicable to each sampling project. For example, trip blanks, are not needed when cross-contamination from volatile parameters is not a concern.

I. TITLE/APPROVAL PAGE

A. Name of Project and/or Site
B. Name of Organization(s) Implementing Project
C. Date of Plan Version
D. Project No./Work Authorization No.
E. Signature Lines for Approval and Dates

II. TABLE OF CONTENTS

III. INTRODUCTION AND PROJECT DESCRIPTION

A. Project Organization
B. Purpose and General Objectives of Project
C. Scope of Project Covered by SAP
D. Description of Project Data Collection Activities/Tests Planned
E. Special Resource Needs (e.g., special equipment and expertise needed)
F. Project Schedule
G. Reference to Corresponding QAPP

IV. SITE BACKGROUND

A. Site Location and Description
B. Site History
C. Physical Setting (e.g., geology and hydrogeology)
D. Existing Data
E. Environmental Concern

V. DATA QUALITY OBJECTIVES

A. Identification of Specific Data Collection Activities/Tests Planned
B. Intended Data Uses/Decisions for Each Measurement Activity/Test
C. Identification of Data Users/Decision Makers
D. Applicable Regulatory or Other Standards

E. Quality and Type of Data Needed to Support Intended Uses/Decisions
F. Definition of Physical and Temporal Study Boundaries/Units
G. Applicable Reference Levels/Standards and Decision Rules (e.g., clean-up levels, permit standards)
H. Identification of Tolerable Limits on Decision Errors
I. Form of Data Used for Decision-Making (e.g., compare average with permit standard)
J. Precision, Accuracy, Completeness, and Comparability (PARCC) Objectives for Each Measurement Activity/Test
    1. Procedures (e.g., calculations) for Determining PARCC Parameters
    2. Qualitative and Quantitative PARCC Objectives

VI. SAMPLING DESIGN

A. Description of Data Collection Design and Rationale
B. Sampling Locations, Sample Types and Matrices
C. Frequency of Collection and Sample Numbers
D. Measurement Parameters (e.g., target compounds)
E. Sample Collection and Analytical Test Methods
F. Sensitivity Needed for Decision-Making (e.g., detection limits, reporting limits)
G. Use of Field Screening

VII. MAPS

A. Site Location
B. Site Layout and Boundaries, including Structural Features (e.g., buildings)
C. Location of Known and Potential Contaminant Sources
D. Proposed Sampling Locations
E. Directions of Surface Water and Groundwater Flow

VIII. SAMPLING METHODS

A. Sample Collection Procedures/Equipment
B. Sampling Locations and Sample Selection
C. Field Measurements (e.g., pH)
D. Field Preparation of Samples
E. Support Facilities
F. Materials/Supplies Needed
G. Sample Containers, Volume, Preservation, and Holding Times
H. Sample Filtration and Preservation Procedures
I. Equipment Decontamination Procedures
J. Investigation Derived Waste Handling

IX. **FIELD INSTRUMENTS**

- A. Identification of Field Instruments
- B. Operating Instructions
- C. Calibration Procedures and Frequency
- D. Maintenance and Function Checks
- E. Availability of Critical Spare Parts (e.g., extra batteries and probes)
- F. Record-keeping Procedures (e.g., calibration logs)

X. **FIELD QUALITY CONTROL SAMPLES** (per matrix)

- A. Background Samples
- B. Duplicate and/or Colocated Samples
- C. Field Blanks
  1. Equipment Rinsate and/or Decontamination Blanks
  2. Trip Blanks (e.g., for volatile parameters)
  3. Other blanks (e.g., pour blanks, bottle blanks)
- D. Other Field QC Samples (e.g., performance evaluation samples)

XI. **ANALYTICAL METHODS** (per parameter per matrix)

- A. Identification of Analytical Methods/Equipment
- B. Description of Sample Preparation Procedures (e.g., grind to <200 mesh)
- C. Identification of Digestion/Extraction Methods
- D. Data Reporting Limits and Units per Parameter
- E. Analytical QC Requirements
  1. Instrument Calibration
  2. QC Samples, Frequency, Control Limits, and Corrective Action Procedures
- F. Laboratory Selection/Arrangements
- G. Laboratory Custody Procedures
- H. Laboratory Documentation and Reporting

XII. **SAMPLE HANDLING AND CUSTODY**

- A. Sample Identification Scheme and Labeling Procedures
- B. Sample Packaging and Shipping Requirements and Procedures
- C. Shipping/Delivery Methods, Schedule, and Notification Requirements
- D. Custody Procedures and Documentation
  1. Examples (e.g., chain-of-custody form)
  2. Information Requirements
- E. Field Records and Documentation
  1. Examples (e.g., field data sheets)
  2. Information Requirements

XIII. **PROJECT OVERSIGHT AND CORRECTIVE ACTION**

A. Oversight of Field Work
   1. Oversight Mechanism (field audits, inspections, logbook review) and Responsibilities
   2. Schedule of Oversight Activities
   3. Oversight Criteria (e.g., compliance with SAP) and Corrective Actions (e.g., resampling, response reports)
   4. Oversight Documentation (e.g., audit checklists and report)

B. Oversight of Laboratory Work
   1. Oversight Mechanism (lab audits, performance evaluation samples, data review) and Responsibilities
   2. Schedule of Oversight Activities
   3. Oversight Criteria (e.g., compliance with lab services agreement) and Corrective Actions (e.g., reanalysis, recalibration)
   4. Oversight Documentation (e.g., audit checklists and report)

C. Other Project Oversight Activities

D. Statement of EPA Oversight Access (e.g., subcontract labs)

XIV. DATA EVALUATION

A. Responsibilities for Data Review and/or Validation

B. Identification/Selection of Data to be Reviewed and/or Validated

C. Frequency of Data Review and/or Validation

D. Assessment of PARCC Parameters

E. Other Data Quality Indicators to be Evaluated (e.g., holding times)

F. Procedures for Data Review and/or Validation

G. Criteria Used to Accept, Qualify, and Reject Data

H. Data Reduction
   1. Example Equations for Evaluating Data
   2. Statistical Treatment of Data
   3. Data Use in Models

I. Evaluation of Data Suitability for Intended Uses (reconciliation with user requirements/DQOs)

XV. PROJECT RECORDS AND REPORTS

A. Content, Distribution, and Schedule for Project Reports (e.g., progress reports, results report)

B. Reporting of Data Quality

C. Record Transfer and Tracking Procedures

D. Identification/Inventory of Project Records (e.g., field logbooks, data packages)

E. Interim Storage, and Final Disposition of Project Records

F. Mechanism for Revising SAP and Handling Field Changes

XVI. HEALTH & SAFETY PLAN

NOTE: The following outline is provided only as an example of some of the information to be addressed in H&S plans. Check the applicable project and OSHA standards for complete content requirements.

A. Identification of PPE
B. Identification of Local Medical Care Facilities
    1. Location (e.g., map and address)
    2. Emergency Phone Number(s)
    3. Emergency Transportation Available
C. Training
    1. Current OSHA
    2. First Aid/CPR
    3. Site Orientation

APPENDIX B

GLOSSARY

GLOSSARY

Accuracy: ensures how close the results are to a true or expected value and can be determined by comparing the analysis of a standard or reference sample to its actual value.

Aliquot: A measured portion of a sample taken for analysis. One or more aliquots make up a sample.

Blind Sample: A type of sample used for quality control purposes, a blind sample is a sample submitted to an analyst without their knowledge of its identity or composition. Blind samples are used to test the laboratory's expertise in performing the sample analysis.

CLP: The EPA's Contract Laboratory Program. The CLP provides analytical services to the 10 EPA Regions through contracted commercial laboratories.

Comparability: The extent to which data can be compared between sample locations or periods of time within a project, or between projects.

Completeness: The comparison between the amount of valid data originally planned to be collected, versus how much was collected.

Concentration: Defined as high, medium, or low, and used to determine how much volume is collected or the analytical protocol to be followed.

Data quality objectives (DQOs): Quantitative and qualitative statements describing the degree of the data's acceptability to the data user(s). They include indicators such as accuracy, precision, representativeness, comparability, and completeness. DQOs specify the quality of the data needed in order to meet the project's goals. The planning process for ensuring environmental data are of the type, quality, and quantity needed for decision making is called the ***DQO process***.

Data turnaround time: The maximum length of time allowed for laboratories to submit analytical data to EPA in order to avoid liquidated damages. Data turnaround time begins at the validated time of sample receipt (VTSR) at the laboratory.

Detection limit: Applied to both methods and equipment, the lowest concentration of a target analyte that a given method or piece of equipment can reliably ascertain and report as greater than zero.

Duplicate sample: Used for quality control, two samples taken at the same time from, and representative of, the same site that are carried through all assessment and analytical procedures in an identical manner. Duplicate samples are used to measure natural variability as well as the

precision of a method, monitor, and/or analyst. More than two duplicate samples are referred to as *replicate samples.*

Equipment or rinsate blank: Used for quality control, types of field blanks used to check specifically for carryover contamination from reuse of the same sampling equipment (see *field blank*).

Field blank: Used for quality control, a field blank is a "clean" sample (e.g., distilled water) that is otherwise treated the same as other samples taken from the field. Field blanks are submitted to the analyst along with all other samples and are used to detect any contaminants that may be introduced during sample collection, storage, analysis, and transport.

Fraction: A specific subunit of an analytical protocol. For example, for low/medium organics, the fractions are volatiles, semi-volatiles, and pesticides/Aroclors.

Instrument detection limit: The lowest concentration of a given substance or analyte that can be reliably detected by analytical equipment or instruments (see also *detection limit*).

Matrix: A matrix is a specific type of medium, such as water, soil, or sediment, in which the analyte of interest may be contained.

Method detection limit (MDL): The MDL is the lowest concentration of a given substance or analyte that can be reliably detected by an analytical procedure (see *detection limit*).

Precision: The degree of agreement among repeated measurements of the same characteristic. It may be determined by calculating the standard deviation, or relative percent difference, among samples taken from the same place at the same time.

Preservative: A chemical added to inorganic and volatile water samples to maintain the integrity of the sample. Some common preservatives include nitric acid, hydrochloric acid, and sodium hydroxide.

Quality Assurance (QA): Refers to the overall *management system* which includes the organization, planning, data collection, quality control, documentation, evaluation, and reporting activities of a particular project. QA is designed to ensure that a product or service meets defined standards of quality with a stated level of confidence.

Quality Assurance Project Plan (QAPP): A formal written document describing the detailed *quality control* procedures that will be used to achieve a specific project's data quality requirements.

Quality Control (QC): Refers to the routine *technical activities* designed to measure quality and limit error in a product or service. Since errors can occur in either the field, the laboratory, or the office, QC must be part of each of these functions.

Quality Control (QC) Samples: Samples used to estimate the precision and accuracy of analytical results in the field and in the laboratory.

Representativeness: The extent to which measurements actually represent the true environmental condition or population at the time a sample was collected.

Sample: A single, discrete portion of the environment collected from a specified physical location at a specific time. The single sample may be placed in multiple vessels.

Sample container: The individual bottle that contains the sample or an aliquot of the sample. The type of sample container varies for different sample fractions and concentrations.

Sample custody: Legal possession of and responsibility for a sample. Documentation of sample custody is maintained on the chain-of-custody part of the traffic report or packing list. The sample is in your custody if any of the following criteria are met: 1) the sample is in your possession or is in your view after being in your possession, 2) the sample was in your possession and then locked up or sealed to prevent tampering, or 3) you have placed the sample in a secured area.

Sample label: Taped or adhesive labels that provide the sample numbers to be assigned to the samples.

Sample number: The sample number from the sample label that identifies the sample or an aliquot of the sample.

Spiked samples: Used for quality control, a sample to which a known concentration of the target analyte has been added. When analyzed, the difference between an environmental sample and the analyte's concentration in a spiked sample should be equivalent to the amount added to the spiked sample.

Split sample: Used for quality control, a split sample is one that has been equally divided into two or more sub-samples. Splits are submitted to different analysts or laboratories and are used to measure the precision of the analytical methods.

Standard deviation(s): Used in the determination of *precision*, the most common calculation used to measure the range of variation among repeated measurements. The standard deviation of a set of measurements is expressed by the positive square root of the variance of the measurements.

Station location: The specific location where samples are collected on a site.

TAL: Target Analyte List. TALs list the target analytes to test for in inorganic analyses.

TCL: Target Compound List. TCLs list the target compounds to test for in organic analyses.

Variance: A statistical term used in the calculation of *standard deviation*, variance is the sum of the squares of the difference between the individual values of a set and the arithmetic mean of the set, divided by one less than the numbers in the set.

Volume: The amount of sample collected. Volume requirements differ between some laboratories, matrices, fractions, and concentrations.

VOA: Volatile Organic compound Analysis. Used synonymously with VOC.

VOC: Volatile Organic Compound.

APPENDIX C

CURRENT FORMS

REGION 8 RSCC FORM I
CONTRACTOR:_____
CSCC:_____

DCN:_____
RAS No:_____

REQUEST FOR ROUTINE ANALYTICAL SERVICES

SITE NAME:_____ SITE MANAGER (EPA/State):_____

CITY, STATE:_____ TELEPHONE NO:_____

CERCLIS ID:_____ SHIPPING CONTACT:_____

SITE SPILL CODE:_____ TELEPHONE NO:_____

OPERABLE UNIT:_____ SAMPLING DATE(S):_____

ACTIVITY TYPE:_____ SHIPPING DATE(S):_____

PROGRAM:_____ TURNAROUND TIME:_____

Routine Analytical Services

Inorganics

MATRIX	NO. OF SAMPLES/ANALYSES	CONCENTRATION	LAB QC SAMPLES
SOIL	TM_____ CN_____	L M H	TM_____ CN_____
WATER	TM_____ DM_____ CN_____	L M H	TM_____ DM_____ CN_____

Organics

MATRIX	NO. OF SAMPLES/ANALYSES	CONCENTRATION	LAB QC SAMPLES
SOIL	VOA_____BNA_____PEST_____	L M H	VOA_____BNA_____PEST_____
WATER	VOA_____BNA_____PEST_____	L M H	VOA_____BNA_____PEST_____

To most efficiently obtain laboratory capability for your request, please address the following considerations, if applicable. Incomplete or erroneous information may result in a delay in the processing of your request.

The Region 8 RSCC Form I cannot be processed by the RSCC until a QAPP, and SAP if applicable, have been approved and this Form I has been signed and dated by the appropriate Site Manager.

Name and date Site Manager (EPA/State) approved QAPP:_____
Title of QAPP:_____
Where can a copy of this QAPP be found? _____

Name and date Site Manager (EPA/State) approved SAP:_____
Title of SAP:_____
Where can a copy of this SAP be found?_____

Signature of **EPA** or **State** Site Manager to signify approval of this analytical services request.

Signature:_____ Date:_____

Date RSCC received RAS Request:_____
Date RAS Request forwarded to CLASS:_____

INSTRUCTIONS FOR COMPLETING THE REGION 8 RSCC FORM I

1) In the upper left corner of the Region 8 RSCC Form I, fill in the name of the company responsible for this sampling event next to CONTRACTOR. The contact person at the contractor's location should be written in the space next to CSCC (Contractor Sample Control Coordinator).

2) The Document Control Number (DCN) and RAS No. blanks located in the upper right corner of the Region 8 RSCC Form I will be assigned by the RSCC and/or CLASS (Contract Laboratory Administrative Support Services).

3) Record the following information in their respective blanks on the Region 8 RSCC Form I:
SITE NAME: name of site to be sampled
CITY, STATE: city and state where the site is located
CERCLIS ID: identification number for the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)
SITE SPILL CODE: "8" followed by two-digit spill code assigned to the site. If one has not yet been assigned, enter "ZZ".
OPERABLE UNIT: two-digit number for the particular section of the site to be sampled. Enter "N/A" if there is no applicable operable unit.
ACTIVITY TYPE: type of activity (i.e.; site investigation, remedial action, etc.)
PROGRAM: "State" or "Superfund"
SITE MANAGER (EPA/State): name of EPA Site Manager or State Site Manager responsible for receiving data package(s)
TELEPHONE NO: telephone number of EPA Site Manager or State Site Manager
SHIPPING CONTACT: name of person in charge of shipping samples
TELEPHONE NO: telephone number of person in charge of shipping samples
SAMPLING DATE(S): anticipated date(s) samples are to be taken
SHIPPING DATE(S): anticipated date(s) samples are to be shipped
TURNAROUND TIME: [calendar days] – for RAS, indicate either 14- or 35-day turnaround; for ULSA, specify a reasonable turnaround time to meet project goals.

4) Samples scheduled for RAS should be indicated in the respective inorganic or organic boxed areas. On the same line as the sample matrix, enter the number of samples to be taken in the space next to the analysis desired. For example, to have 15 water samples scheduled for volatile analysis, write "15" in the blank next to VOA. Circle the expected sample concentration (low, medium, or high). In the LAB QC SAMPLES column, indicate either the number of samples which will be taken and shipped to the laboratory for QC purposes (i.e.; MS/MSD for organics or spike/duplicate for inorganics). **Refer to Chapter II of the "User's Guide to the Contract Laboratory Program" for the definition of laboratory QC samples.**

5) An approved Quality Assurance Project Plan (QAPP), **and SAP (Sampling and Analysis Plan) if applicable**, for the scheduled sampling event should be confirmed prior to submitting the Region 8 RSCC Form I. Fill in the name of the EPA/State Site Manager and date the QAPP, **and SAP if applicable**, was approved. Obtain the signature of the applicable (EPA or State) site manager to signify approval of the analytical services request. The Region 8 RSCC Form I cannot be processed by the RSCC until a QAPP, **and SAP if applicable**, have been approved and the request has been signed..

6) Fax the Region 8 RSCC Form I to the Sample Broker at (303) 312-6067 prior to the following deadlines:

RAS – 9:00 a.m. Wednesday of the week prior to sampling

If you have any questions, please contact the RSCC representative at (303) 312-6047.

REGION 8 SAMPLE BROKER, FAX - 303-312-6558
CONTRACTOR: _____
CSCC: _____

DCN: _____
ULSA No: U8- _____

REQUEST FOR UNIQUE LABORATORY SAMPLE ANALYSES

SITE/STUDY NAME: _____ CITY, STATE: _____

OPERABLE UNIT: _____ ACCOUNT NUMBER: _____
(if Superfund)

SITE/PROJ. MANAGER: _____ TELEPHONE NO: _____

SAMPLING DATE(S): _____ SHIPPING DATE(S): _____

SHIPPING CONTACT: _____ TELEPHONE NO: _____

PROJECT OFFICER: _____ TELEPHONE NO: _____
(if there is a Field Contractor)

TURNAROUND TIME: _____ POTENTIAL ENFORCEMENT ACTION ? YES NO
(QA/R5 - Element B3)

Date Broker received ULSA Request: _____

To most efficiently obtain laboratory capability for your request, please address the following considerations, if applicable. Incomplete or erroneous information may result in a delay in the processing of your request.

The ULSA Request form cannot be processed by the Sample Broker until a QAPP, and SAP if applicable, have been approved.

Name and date Site Manager (EPA/State) approved QAPP: _____
Title of QAPP: _____
Where can a copy of this QAPP be found ? _____

Name and date Site Manager (EPA/State) approved SAP: _____
Title of SAP: _____
Where can a copy of this SAP be found ? _____

Signature of **EPA** or **State** Site Manager to signify approval of this analytical services request.

Signature: _____ Date: _____

1. General description of analytical services requested:
(QA/R5 - Element B1)

MATRIX	ANALYSIS (method)	NO. OF SAMPLES (without QC)	QC SAMPLES

2. Analytical protocol required (analytical method & method number, extraction or digestion method & method number for each matrix if required, etc.):
(QA/R5 - Element B4)

3. Special technical instructions (specify any requirements outside of existing protocol such as target analytes, reporting limits, subsampling methods for each matrix, dilution specifications, example calculations if applicable, etc.):
(QA/R5 - Elements A6 & B4)

4. Analytical results required (specify laboratory documentation and reporting requirements, reporting units, specify format requirements, indicate if electronic deliverables are needed and required format, chain-of-custody documentation, etc.).
(QA/R5 - Elements A6 & B4)

5. Other (any additional specifications, attach supplementary information if needed):
(QA/R5 - Element B4)

The laboratory must forward the Region 8 data package to:

6. Data Requirements (reporting limits; per analyte per matrix; reporting units; applicable reference levels, etc.):
(QA/R5 - Elements A7, B1 & B4)

Parameter	Detection Limit	Precision Desired (± % or Concentration)

7. QC Requirements (PE samples & frequency; spikes, duplicates, blanks & frequency; acceptance criteria):
(QA/R5 - Elements B1, B5 & B7)

QC Activities	Frequency	Limits (% or Concentration)

8. Action required if limits are exceeded (criteria, procedures & responsibilities; documentation, etc.):
(QA/R5 - Elements B5 & D1)

The laboratory will stop analysis and contact Jim Gindelberger immediately at 303-312-6984

Please FAX this request to the Regional Sample Broker (at 303-312-6558) as soon as possible to expedite the processing of your request for unique laboratory sample analyses. Should you have any questions or need assistance, please contact the Broker at 303-312-6984 or the alternate Broker at 303-312-6738.

PREPARATION AND SUBMITTAL OF REGION 8 REQUEST FOR UNIQUE LABORATORY SAMPLE ANALYSIS (ULSA)

1.0 PURPOSE

The purpose of this procedure is to facilitate timely processing of Unique Laboratory Analytical Services requests by providing step-by-step guidance for Site/Project Managers in preparing a **Request for Unique Laboratory Sample Analyses** (ULSA request) form.

2.0 SCOPE

This SOP addresses the completion of the **Request for Unique Laboratory Sample Analyses** (ULSA request)form.

3.0 OUTLINE OF PROCEDURE

This Standard Operating Procedure (SOP) sets forth the process necessary to prepare and submit a **Request for Unique Laboratory Sample Analyses** form. An ULSA request is used to procure analytical services which, because of short turn-around time, low detection limits or specific analyses requested, are not available through the Contract Laboratory Program (CLP).

A request for unique analytical services is made by a site or project manager, sometimes through a site contractor, and is processed (as is a CLP Routine Analytical Services request) through the Regional Sample Broker (Jim Gindelberger).

The first page of the **Request for Unique Laboratory Sample Analyses** form contains blanks to be filled-in with information about the site or study from which samples will be collected. In cases in which this information is addressed by QA/R5, the appropriate QA/R5 elements are referenced on the form. This information includes the site or study name and the city and state in which it is located, the operable unit number (if it is a Superfund site), the account number against which Regional Laboratory personnel may charge their time, the site or project manager and phone number, sample and shipping dates, the name of the shipping contact (who is responsible for getting the samples to the laboratory) and phone number, the contract project officer and phone number (if a field contractor is responsible for collecting and/or shipping the samples), the required turnaround time (from sample receipt to analytical report

generation) and whether or not these samples involve potential enforcement action.

Next is a series of blanks to be filled-in which indicate the name of the approval authority and the date of approval of the Quality Assurance Project Plan (QAPP) under which these samples are being collected, along with the title of the QAPP. In addition there is a series of blanks to be completed which indicate the name of the approval authority and date of approval of the Sampling and Analysis Plan (SAP), if applicable, under which these samples are being collected, along with the title of the SAP. A copy of the QAPP and a copy of the SAP (if applicable) must accompany the ULSA Request unless a copy of each of these plans is already on file with the Regional Quality Assurance Officer (Rick Edmonds). Obtain the signature of the applicable (EPA or State) site manager to signify approval of the analytical services request. **No lab assignment will be made, however, until a QAPP and/or SAP has been approved for the ULSA work requested and the site manager has signed the analytical services request.**

The **Request for Unique Laboratory Sample Analyses** form also contains information about the samples to be collected, the analyses to be performed, the quality assurance/quality control (QA/QC) activities that are to take place, including specified corrective actions, and the information to be included in the final report.

Upon receipt of the ULSA request the Sample Broker will review the request, documenting and resolving any questions or concerns through discussion with the Site or Project Manager and/or the site consultant.

In procuring a laboratory to provide analytical services, the Sample Broker adheres the following hierarchy:

- The EPA Regional Laboratory
- Other Federal Laboratories with EPA has Interagency Agreements (IAGs)
- Procurement of commercial laboratory services through the small purchase order process

When a laboratory is identified, the Broker will notify the shipping contact, by FAX or phone, of the laboratory assignment and ULSA number to include with the samples on the custody documents.

4.0 GLOSSARY

CLP - Contract Laboratory Program

IAG - Inter-Agency Agreement

QAPP - Quality Assurance Project Plan

QA/QC - Quality Assurance/Quality Control

QA/R5 - "EPA REQUIREMENTS FOR QUALITY ASSURANCE PROJECT PLANS FOR ENVIRONMENTAL DATA OPERATIONS*" - EPA QA/R5 - JULY 1992 - *Region VIII Specific Requirements As Approved in QMP by EPA Headquarters in November 1992

RAS - Routine Analytical Services

SAP - Sampling and Analysis Plan

TMS - Technical and Management Services, EPA, Region VIII

ULSA - Unique Laboratory Sample Analysis

5.0 REFERENCES

- INSTRUCTIONS FOR COMPLETING THE REGION 8 RSCC FORM I (printed on the back of the Region 8 RSCC FORM I)

- "EPA REQUIREMENTS FOR QUALITY ASSURANCE PROJECT PLANS FOR ENVIRONMENTAL DATA OPERATIONS*" - EPA QA/R5 - JULY 1992 - *Region VIII Specific Requirements As Approved in QMP by EPA Headquarters in November 1992

6.0 SPECIFIC PROCEDURE

6.1 COMPLETING THE REGION 8 UNIQUE LABORATORY SAMPLE CLIENT REQUEST FORM

6.1.1 Record the following information in their respective blanks on the Region 8 **Request for Unique Laboratory Sample Analyses** form:

6.1.1.1 **SITE/STUDY NAME:** name of site or study to be sampled

6.1.1.2 **CITY, STATE:** city and state where the site or study is located

6.1.1.3 **OPERABLE UNIT:** (to be completed only if this is a Superfund activity) two-digit number for the particular section of the site to be sampled

6.1.1.4 **ACCOUNT NUMBER:** the account number to which EPA Region VIII personnel may charge their time

6.1.1.5 **SITE/PROJ. MANAGER:** name of EPA Site or Project Manager or State Site Manager responsible for receiving data package(s)

6.1.1.6 **TELEPHONE NO:** telephone number of EPA Site or Project Manager or State Site Manager

6.1.1.7 **SAMPLING DATE(S):** anticipated date(s) samples are to be collected

6.1.1.8 **SHIPPING DATE(S):** anticipated date(s) samples are to be shipped

6.1.1.9 **SHIPPING CONTACT:** name of person in charge of shipping samples - This will be the person who is contacted when a laboratory assignment is made.

6.1.1.10 **TELEPHONE NO:** telephone number of person in charge of shipping samples

6.1.1.11 **PROJECT OFFICER:** name of the Contract Project Officer if the Shipping Contact is a contractor

6.1.1.12 **TELEPHONE NO:** telephone number of the Contract Project Officer if the Shipping Contact is a contractor

6.1.1.13 **TURNAROUND TIME:** specify a reasonable turnaround time to meet project goals

6.1.1.14 **POTENTIAL ENFORCEMENT ACTION ? YES NO** *(QA/R5 QAPP element B4)* circle either "YES" or "NO" to indicate whether or not there is a potential for enforcement action - This will indicate to the laboratory the appropriate level of sample custody documentation.

6.1.1.15 **Name and Date Site Manager (EPA/State) approved QAPP:** indicate the name of the approval authority and the date of approval of the Quality Assurance Project Plan (QAPP) under which these samples are being collected. A copy of the QAPP must accompany the ULSA Request unless a copy is already on file with the Regional Quality Assurance Officer (Rick Edmonds). **No lab assignment will be made, however, until a QAPP and/or SAP has been approved for the ULSA work requested.**

6.1.1.16 **Title of QAPP:** indicate the title of the Quality Assurance Project Plan (QAPP) under which these samples are being collected

6.1.1.17 **Where can a copy of the QAPP be found?:** indicate whether a copy of the QAPP may be found in the Regional QA Officer's files, the Superfund Record Center or the Site Manager's files

6.1.1.18 **Name and Date Site Manager (EPA/State) approved SAP:** indicate the name of the approval authority and date of approval of the Sampling and Analysis Plan (SAP), if applicable, under which these samples are being collected. A copy of the SAP (if applicable) must accompany the ULSA Request unless a copy is already on file with the Regional Quality Assurance Officer (Rick Edmonds). **No lab assignment will be made, however, until a QAPP and/or SAP has been approved for the ULSA work requested.**

6.1.1.19 **Title of SAP:** indicate the title of the Sampling and Analysis Plan (SAP), if applicable, under which these samples are being collected

6.1.1.20 **Where can a copy of the SAP be found?:** indicate whether a copy of the SAP may be found in the Regional QA Officer's files, the Superfund Record Center or the Site Manager's files

6.1.1.21 **Signature of EPA or State Site Manager to signify approval of this analytical services request:** obtain the signature of the site manager responsible for this project in order to initiate the expenditure of EPA funds

6.1.2 **1. General description of analytical services requested:**

(QA/R5 QAPP element B1) For the samples to be collected indicate the type of matrix (soil, water, sludge, oil, fish, etc.), type of analysis OR method number, number of samples without QC, and number of QC samples.

6.1.3 **2. Analytical Protocol required (analytical method & method number, extraction or digestion method & method number for each matrix if required, etc.):**

(QA/R5 QAPP element B4)

Specify analytes of interest and analytical/extraction/ digestion methodologies. If methodologies are unknown, seek technical assistance. Acceptable methodologies are prescribed in some regulations. Data Quality Objectives, sample type and/or reporting limit may influence the selection of analytical methods.

6.1.4 **3. Special technical instructions (specify any requirements outside protocol such as target analytes, reporting limits, subsampling methods for each matrix, dilution specifications, example calculations if applicable, etc.):**

(QA/R5 QAPP elements A6 & B4) Include any special instructions which may not apply to all types of samples, analytical methods, or data deliverables. Indicate whether samples are high concentration or if samples represent a hazard. Seek technical assistance if there is a question.

6.1.5 **4. Analytical results required (specify laboratory documentation and reporting requirements, reporting units, specify format requirements, indicate if electronic deliverables are needed and required format, chain-of-custody documentation, etc.):**

(QA/R5 QAPP elements A6 & B4) If you have any reasonable specific requirements for the format in which you would like to see the data, include them here. This might include electronic data deliverables, a format to match that of previous data from the same site or a format to match that of data from similar site. Chain-of-custody documents, copies and/or originals of laboratory raw data, example calculations, dilution logs, sample preparation logs, etc. are examples of routinely requested documents.

6.1.6 **5. Other (any additional specifications, attach supplementary information if needed):**
(QA/R5 QAPP element B4) Include any other information or request if not previously addressed.

6.1.7 **6. Data Requirements: (reporting limits; per analyte per matrix; reporting units; applicable reference levels; etc.):**
(QA/R5 QAPP elements A7, B1 & B4) Include any specific requirements for acceptable detection limits and or precision. Reporting limits may be a more useful specification than detection limits. Look at Data Quality Objectives and seek technical assistance.

6.1.8 **7. QC Requirements: (PE samples & frequency; spikes, duplicates, blanks & frequency; acceptance criteria):**
(QA/R5 QAPP elements B1, B5 & B7) Include any specific requirements for the laboratory to analyze known or unknown audit samples. Include action required if known audit results are outside acceptance limits. Look at Data Quality Objectives and seek technical assistance.

6.1.9 **8. Action required if limits are exceeded: (criteria, procedures & responsibilities; documentation, etc.):**
(QA/R5 QAPP elements B5 & D1) Specify the actions which you want the laboratory to take if the acceptance limits which you specified are not met. These may include notifying the Sample Broker immediately for instructions, reanalyze the sample, dilute and reanalyze the sample, restandardize the instrument, run a lab blank before and after the sample, etc. **INCLUDE THE FOLLOWING LANGUAGE: The laboratory will need to contact Jim Gindelberger immediately at (303) 312-6984**

6.2 FORWARDING THE ULSA REQUEST TO THE REGION 8 SAMPLE BROKER

6.2.1 Fax or deliver the completed **REQUEST FOR UNIQUE LABORATORY SAMPLE ANALYSES** form to the Region 8 Sample Broker as soon as possible to expedite the processing of your request for unique laboratory sample analyses. **The FAX Number is 303-312-6067.** You may speak with the Sample Broker (Jim Gindelberger) at 303-312-6984, or his alternate (Ken Wang) at 303-312-6738.

DIVISION OF EPIDEMIOLOGY AND LABORATORY SERVICES
UTAH DEPARTMENT OF HEALTH

January 8, 1997

SAMPLE RECEIVING GUIDELINES FOR ENVIRONMENTAL SAMPLES

The following are intended to give environmental program managers and sample collectors guidelines to insure proper sample receiving and processing at the laboratory. Some of these guidelines are a restatement of common understanding that has been in place for a long time.

1. Sample requests that have short holding times:

a. BODs: DWQ representatives need to schedule delivery of samples with the laboratory in advance. BODs can be set up on Wednesdays, Thursdays, or Fridays except when holidays occur. Except for unusual circumstances, the laboratory will not set up BODs nor read the five-day oxygen depletion results on holidays or weekends. BOD samples must be collected and promptly delivered to the laboratory to assure that the short holding ttime requirement is met. Samples must be delivered prior to 1 P.M. if they are to be set up on that day.

b. Turbidity: Samples requiring turbidity analysis must be collected and promptly delivered to the laboratory to assure that analysis is performed within the 2-day holding time. Samples requiring turbidity analysis must be submitted to the laboratory by 2 P.M. on Friday, or the day before a holiday, or if the analysis on that day is required to be within holding times.

c. Nitrite: Samples requiring nitrite analysis must be collected and promptly delivered to the laboratory to assure that analysis is performed within the 2-day holding time. Except when a health emergency may be involved, the laboratory performs nitrite analysis on Thursdays. Samples need to be delivered on Wednesday or prior to 9 A.M. on Thursday.

2. **Samples received after 3 P.M.:** Samples received after 3 P.M. may not be logged until the following workday. However, samples received prior to 5 P.M. will be properly stored including chain of custody samples. Sample collectors are encouraged to call the laboratory in advance if submission of chain of custody samples are expected after mid afternoon,.

3. **Sample requests for UST, CERCLA, RCRA and any special projects:** The appropriate laboratory section chief or his representative will come to the sample receiving room to assist whenever these samples are delivered to the laboratory.

4. **Requests requiring immediate or priority analysis:** Environmental program managers or sample collectors must notify a laboratory manager to insure proper handling and processing of samples requiring urgent processing. The laboratory can be contacted during non working hours by pager by calling 241-1172 and entering a return phone number followed by the # sign.

5. **Samples suspected of containing high contaminant levels:** The sample collector or program manager should notify sample receiving so that these samples can be stored in a location to avoid contamination of other samples.

Project Name Cost Code 367 ER	Use black ink only **CHAIN OF CUSTODY RECORD**
Sampler Name (please print)	State of Utah Department of Health Division of Laboratory Services 46 North Medical Drive Salt Lake City, Utah 84113-1105 (801) 584-8400
Person to Address Report / Questions To:	
Agency: DEQ – DERR	
Street: P. O. Box 144840	
Cty,St,Zip: Salt Lake City, UT. 84114-4840 Phone: 536-4100 FAX: 536-4242	

Field ID#	Date Sam	Time	Matrix	Sample Description	8260 VOC	8270 BNA	8081 PCB	BTEX	TPH	METALS pick #	OR circle nose for analysis	Preservative Used See list below							DLS Sample Number

Total Metals: 8,12, or 18

A: As, Ba, Cd, Cr, Pb, Hg, Se, Ag
B: the above 8 plus Cu, Fe, Mn, Zn
C: the above 12 plus Al, Be, Co, Fe, Mo, V

Preservative Used. 1 = HCl; 2 = HNO3; 3 = NaHSO4; 4 = H2SO4; 5 = Ice only; 6 = Not preserved; If other, specify.

Individual metals (please circle): Al Sb As Ba Be Cd Ca Cr Co Cu Fe Pb Mg Mn Hg Mo K Se Ag Na Sr Tl V Zn

State Lab COC Form - Revised May 19, 2000

Dispatched By: (For Mailing/Shipping)	Date	Time	Courier Company Name	Invoice/Airbill #	
Relinquished By: (For Transfer to Intermediate Custodian)	Date	Time	Received By:	Date	Time
Relinquished to DLS By: (For Transfer to Lab by Hand)	Date	Time	Received for DLS By:	Date	Time

CHAIN OF CUSTODY INSTRUCTIONS

1. To help eliminate crowding and confusion in our receiving office, we ask that the following be performed before you bring samples in:
    a. Attach all seals,
    b. Fill out this form in black ink
2. To ensure smooth handling of your samples please:
    a. Record time using a 24 hour clock,
    b. Do not mark in areas reserved for DLS.
3. To ensure an unbroken chain:
    a. While in your custody ensure that the samples meet at least one of the following conditions at all times:
        1. Are in your physical possession, or
        2. Are within your sight after having been in your possession, or
        3. Are under your lock or seal, after having been in your possession.
    b. Ensure that the first relinquished / dispatched line used is signed by the sampler, subsequent lines used must be signed by the receiver, and so on. Do not worry about the order of the lines on the page, so long as dates and times are included
    c. Dates and times relinquished and received must match exactly
4. Required Form Fields
    a. Sampler signature must be included to demonstrate an unbroken chain
    b. Field ID must be included to demonstrate an unbroken chain, and so DLS can relate analysis requests to the proper bottles
    c. Date, Time and Type sampled are information required by DLS, and help establish the chain
    e. Location is needed to establish the chain
    f. Number of containers is information required by DLS, and is also integral to establishing the chain
    g. Test categories must be checked to ensure that the appropriate analysis are performed. Default methods are BTEXN by method 8020, TPH by 8015 modified, Halogenated volatiles by 8260 and Oil & Grease by 413.1. If you check for MS, you will get BTEXN and Halogenated volatiles by method 8260, GC/MS. Occasionally, for convenience, the lab may run GC/MS even you do not check the box for MS. If requesting any other methods, please make special arrangements prior to sample delivery. Check which tests you performed for each sample.
    h. Use "Dispatched By" only if a courier is used
    i. Use "Relinquished By" only if there is an intermediate custodian in the chain
    j. When relinquishing to DLS use the bottom line
    k. Use a "Received By" line only if you are receiving custody as intermediate